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Exhibit A

Glaser

Reprinted from BIOLOGICAL EFFECTS AND HEALTH IMPLICATIONS OF MICROWAVE RADIATION, Symposium Proceedings, Richmond, Virginia, September 17-19, 1969 (BRH/DBE 70-2) (PB 193 898).

CLINICAL AND HYGIENIC ASPECTS OF EXPOSURE TO ELECTROMAGNETIC FIELDS

(A Review of the Soviet and Eastern European Literature)[1]

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INTRODUCTION

It has long been apparent that electromagnetic fields impose a health hazard, especially at field intensities greater than approximately 15 mW/cm², which cause thermal (heating) responses in the organism. Only quite recently it is suspected, from the Soviet and East European literature, that these fields might also elicit certain functional or so-called "specific" responses, especially in the nervous system, at field intensities less than 10–15 mW/cm², which do not cause heating.

Prior to 1964, no comprehensive effort had been attempted in this country to review the world (especially the Soviet and East European) literature on the general biological effects of microwaves. Soviet literature was in most cases scattered, quite difficult to locate, and consequently had never come to the attention of the U.S. scientific community. When in 1964, one of the first reviews on this subject was attempted by the writer, then affiliated with the Library of Congress, it was speculated by some authorities on the subject that an extremely low yield of literature would result from the attempt. It was therefore quite surprising that a search of the Soviet and Eastern European literature on the biological effects of microwaves revealed a large and virtually unexploited body of information which had never come to the attention of the U.S. scientific community. The first review (1) contained 132 references to Soviet and East European work on this subject. Subsequent reviews by the author (2–4) and a number of others (5–9) revealed that some of the most active research in the world was being conducted in the Soviet Union and some of the Eastern European countries.

[1] The views expressed by the author do not necessarily represent those of the U.S. Navy.

It is the purpose of this paper to review Soviet and Eastern European studies of the effects of radiofrequency fields on the human organism. An attempt will be made to summarize the more noteworthy findings of some of the literally hundreds of published works devoted to this subject and to underscore the need for a more critical and systematic treatment of this subject. This review will concentrate nearly exclusively on human clinical studies and occupational hygiene surveys and will not consider the more theoretical or experimental aspects of the biological effects of microwaves.

BACKGROUND

As early as 1933, certain Soviet scientists had already recognized that electromagnetic fields affected the human nervous system. In 1937, Turlygin (10) published one of the first comprehensive Soviet accounts of the effects of centimeter waves on the human central nervous system. He found that CNS excitability was increased by 100% of the control level when a crude spark oscillator in the vicinity of the head of a subject was switched on. In a lengthy review article, Livshits (11) cited no fewer than 28 Soviet publications on the general subject of clinical and biological microwave effects which had been published by the end of the 1930's.

During the 1940's and early 1950's, there was an understandable lull in research on this subject due to World War II. By the middle and late 1950's, there appeared a veritable deluge of Soviet literature dealing, in the main, with the clinical and hygienic aspects of microwave exposure which has continued unabated to this day. By the early 1960's, the Eastern European countries of Czechoslovakia and Poland had also become extremely active in the area of microwave exposure effects. In a cursory

search of the Soviet and Eastern European literature on this subject alone, a total of about 100 publications authored by 75 researchers was found and this figure is probably a conservative reflection of the available works which are estimated to be several hundred.

In an attempt to summarize the prolific Soviet and Eastern European work on clinical and hygienic aspects of exposure to microwaves, it became apparent that a number of human systems and functions had been documented to be affected by this factor (Table 1). By far the most frequently and repeatedly reported human responses to microwaves involve the central nervous system. These responses have been noted for a wide range of frequencies (~30–300,000 MHz) at both thermogenic (>10 mW/cm²) and nonthermogenic (microwatts to milliwatts/cm²) intensities.

An often disappointing facet of the Soviet and East European literature on the subject of clinical manifestations of microwave exposure is the lack of pertinent data on the circumstances of irradiation; frequency, effective area of irradiation, orientation of the body with respect to the source, waveform (continuous or pulsed, modulation factors) exposure schedule and duration, natural shielding factors, and a whole plethora of important environmental factors (heat, humidity, light, etc.) In addition, the physiological and psychological status of human subjects such as health, previous or concomitant medication, and mental status is also more often than not omitted. These variables, both individually and combined, affect the human response to microwave radiation. Despite these omissions, however, the reviewer cannot help but be impressed both by the consistency of the findings and the large size of Soviet and East European clinical and hygienic surveys which have involved literally thousands of people over the past 20 or more years.

CLINICAL MANIFESTATIONS OF EXPOSURE TO RADIOFREQUENCY FIELDS

General Clinical Syndromes

Many Soviet clinical workers have attempted to categorize the chronological stages of human responses to microwaves. Panov et al. (12) proposed three categories or stages of responses to microwaves (Table 2). These were listed as the asthenic syndrome, characterized by fatigue, depression, and a number of other changes. This first stage is not marked by severe episodes such as fainting or dramatic changes in pulse or blood pressure and the subject responds to outpatient treatment. The second category is called the "syndrome of autonomic and vascular dystonia". The essential feature of this stage is pulse lability (brady- and tachycardia), blood pressure lability (hypo- or hypertension), EKG changes, and general neurocirculatory asthenia. Severe episodes such as fainting spells may occur and the subject requires hospitalization of unspecified nature or duration. The third stage is referred to as the diencephalic syndrome in which visceral dysfunctions and crises are observed. Typical episodes during this stage are listed as "apathic ambulic" disorders, hypersomnia, hypokinesis, hypothalamo-pituitary-suprarenal weakness, and inhibition of sexual and digestive reflexes. Panov claims that these changes are not always reversible and that subjects require hospitalization. It should be noted that Panov did not specify the nature or duration of outpatient or hospital treatment, nor did he relate these symptoms to specific irradiation parameters.

TABLE 1

Effects of electromagnetic radiation on the human organism

I. Central Nervous System
II. Autonomic Nervous System
III. Neurohumoral Systems
IV. Endocrine Glands and Functions
V. Eye and Ocular Functions
VI. Blood and Hematopoietic Systems
VII. Miscellaneous Organs

General Subjective Complaints (Indirect Effects on the CNS)

A large number of East European and especially Soviet clinical and hygienic workers (13–22) have consistently and repeatedly documented an astonishing number of subjective complaints which are usually referred to as evidence of the direct or indirect effect of microwaves on the central nervous system (Table 3). These responses have been reported for a wide range of wavelengths (30–300,000 MHz) and field intensities (microwatts to several milliwatts/cm²). Unfortunately, it is often difficult to attach any significance to Soviet clinical findings in the absence of pertinent data on exposures and on patient backgrounds. Typical, for instance, was a survey conducted by Sadchikova (21) in which three groups of occupational personnel (technicians, assemblers, and maintenance workers around centi-

TABLE 2

Soviet classification of general clinical syndromes of exposure to electromagnetic radiation EMF's

A. The Asthenic Syndrome (reversible; outpatient treatment)
   1. fatigability and emotional changes
   2. acrocyanosis
   3. increased perspiration of extremities
   4. increased pilomotor reflex
   5. dermographism
   6. pulse lability
   7. blood pressure lability
B. Autonomic Cystonia (reversible; hospitalization)
   1. hyper- or hypotension
   2. bradycardia and tachycardia
   3. changes in EKG signs
   4. fainting spells
C. Diencephalic Syndrome (usually reversible; hospitalization)
   1. insomnia
   2. adynamia
   3. hypothalamo-pituitary-suprarenal inhibition
   4. inhibition of sexual function and digestive reflexes

meter wave generators) were exposed to: (1) periodic intense radiation (3–4 mW/cm²); (2) moderate radiation (tenths of mW/cm²); and (3) weak radiation (hundredths-tenths of mW/cm²). As can be seen in Table 4, the group exposed to the weakest radiation was shown to display the highest incidence of complaints. This finding and lack of pertinent exposure data such as duration and affected body area make these data difficult to accept on face value. On the other hand, Edelwejn (14) has conducted interesting and comprehensive neurological examinations and interviews of Polish personnel exposed for up to six hours/day to microwave field intensities of 10 microwatts to several milliwatts/cm². He found that many of the subjective complaints listed in Table 3 (headaches, dizzy spells, fatigue, perspiration, etc.) depended upon the length of employment and degree of exposure. Only subjects exposed to high (mW/cm²) intensities exhibited EEG changes. Edelwejn was of the opinion that there is a dramatic response to microwave exposure occurring during the first three years which are accompanied by neurotic symptoms. This three year period is followed by a phase of gradual adaptation. The reappearance of neurologic symptoms occurs after a long period (many years) of exposure to microwaves, even after adaptation has occurred.

Osipov (1965) (20) in a review of neurologic responses to microwave exposure concluded that most subjective symptoms were reversible and that pathological damage to neural structures was insignificant. Only rarely were microwaves found to cause hallucinations, syncope, adynamia and other manifestations of the so-called "diencephalic" syndrome.

Soviet workers have also documented subjective complaints identical to those in Table 3 as a result of exposure to electric and magnetic fields. Vyalov et al. (23) reported characteristic microwave symptoms such as headache, fatigue etc., in workers exposed to 150–1500 oersted magnetic fields. Asanova (24) reported analagous findings for workers exposed to 115–125 microampere fields around hydroelectric stations.

Functional Changes in the CNS

Many Soviet and Eastern European workers have attempted to identify specific CNS functional responses to microwave exposure. Most Soviet workers are of the opinion that the CNS is the most sensitive of all systems to the effects of microwaves, both at thermogenic and nonthermogenic field intensities. Based primarily upon experimental research, Presman (9) is of the opinion that the hypothalamus is the most sensitive CNS structure to microwave effects which would explain, in his view, the high incidence of blood and humoral changes noted in human subjects exposed to this factor.

Changes in human CNS function have been evaluated on the basis of EEG surveys, reflex tests, and general neurological examinations (Table 5). These changes are reported for a wide range of frequencies and field intensities (thermal and nonthermal). However, functional CNS responses appear to be de-

TABLE 3

General subjective complaints resulting from exposure to electromagnetic radiation

1. Pain in head and eyes
2. Lacrimation
3. Weakness, weariness and dizziness
4. Depression, antisocial tendencies, general irritability
5. Hypochondria, sense of fear, and general tension
6. Impairment of memory and general mental function
7. Adynamia and inability to make decisions
8. Inhibition of sex life (male)
9. Scalp sensations and loss of hair
10. Chest pain and heart palpitation
11. Dyspepsia, epigastric pain, and loss of appetite
12. Trembling of eyelids, tongue, and fingers
13. Asthma
14. Brittle fingernails
15. Sensitivity of mechanical stimulation and dermographism

TABLE 4

Changes in the nervous system as a result of exposure to microwaves

		Changes observed (in % of subjects studied)							
Group	No. examined	Headache	Increased fatigue	Increased irritability	Sleepiness	Delayed dermorgraphism	Slowed orthostatic reflex	Wrist hyperdrosis	Thyroid hypertrophy
1	184	12	20	8	2	16	19	6	15
2	129	39	31	12	14	7	21	37	—
3	78	36	31	15	19	14	11	26	52
Control	100	8	10	8	2	—	—	4	14

pendent upon wavelength; direct effects on the brain were reported by Gordon (1964) (25) and Presman (9) to intensify with increase in wavelength. However, when reactions are due to a combination of peripheral and direct stimulation, it is impossible to correlate response with wavelength.

A number of workers have reported changes in EEG patterns as a result of exposure to microwaves. Klimkova-Deutschova (26), a Czechoslovakian researcher, reported that both clinical and EEG findings suggested a predominance of an inhibition process. EEG's showed a predominance of sleep rhythms. In this connection, the interesting (if rather curious) work of Ivanov-Muromskiy (27), a Soviet expert on electrosleep and electroanesthesia deserves comment. His research on human subjects suggested that pulsed (10–1000 Hz) UHF fields of nonthermal intensity directed from bitemporal electrodes a few inches from the subject's head could induce inhibition similar to that produced by pulsed electrical currents (electrosleep). Unfortunately, this research was not described in detail by Ivanov-Muromskiy.

TABLE 5

Functional CNS changes resulting from exposure to electromagnetic radiation

1. Changes in EEG patterns
   a. "asthenic" signs
   b. predominance of inhibition process
   c. increased incidence of slow, high amplitude waves
   d. decreased incidence of alpha rhythms and waves
   e. predominance of "sleep" rhythms
2. Perceptual changes
   a. hallucinations (visual)
   b. decrease in ocular blind spot area
   c. shortening of optic chronaxie and reduction of rheobase
   d. auditory sensitivity changes
   e. decreased olfactory sensitivity
   f. increased olfactory activity
   g. parapsychologic phenomena
3. Alternating arousal and drowsiness
4. Stimulation of motor functions
5. Depression of mental functions
6. Involuntary motor reactions

Drogichina (13) reported that CNS damage is characterized by the "asthenic syndrome" which can be detected from EEG and neurological findings. Presman (9), in reviewing Soviet, Czechoslovakian, and Polish work, reports that the EEG's of subjects exposed to weak (nonthermal) microwave field intensities show an increased incidence of slow, high amplitude waves. In Poland, Edelwejn and Baranski (14) reported a decreased incidence of alpha rhythms and a decreased percentage of alpha waves in subjects exposed to "high" (mW/cm^2) intensities of microwave fields. All subjects examined in this study over-reacted to the administration of cardiozol, a respiratory and cardiac stimulant. In general, because of the rather primitive state-of-the-art of EEG analysis, these findings should be viewed with extreme caution.

Perceptual changes as a result of exposure to microwaves have also been frequently reported. Livshits (28) reported that "high intensity" microwaves had been found by Soviet workers to cause hallucinations. He also reported that high frequency, high intensity fields had been demonstrated to cause involuntary motor reactions in one healthy individual. Matuzov (29) noted visual perception changes after a 10 minute exposure to 10 cm microwaves of nonthermal (1.1 mW/cm^2) intensity. He found a considerable decrease in blind spot area,

TABLE 6

Autonomic and cardiovascular effects of electromagnetic radiation

1. Changes in cardiac function (EKG)
   a. decreased spike amplitude
   b. lengthened QRS interval
   c. slowed auricular and ventricular conductivity
2. Bradycardia and tachycardia
3. Hyper- and hypotension
4. Increased precapillary resistance
5. Increased vascular elasticity

shortening of optic chronaxie, and reduction of rheobase in two subjects. These effects were judged to be nonthermal (specific) and were found to be reversible. Sheyvekhman (30) noted changes in auditory sensitivity (5–10 dB) in response to 6 meter waves pulse modulated at 300, 1000, or 4000 Hz applied for five minutes to the heads of human subjects. He did not clarify whether sensitivity was increased or decreased. Lobanova and Gordon (31) noted a decrease in olfactory sensitivity after exposure to microwaves and suggested that this response might be a good index for identifying harmful microwave effects. These authors also found an increase in olfactory excitability (decreased threshold) after a single dose of caffeine. This was suggested as evidence of functional olfactory changes caused by microwaves.

In the realm of parapsychology, it is interesting to note that leading Soviet researchers who strongly believe in the nonthermal CNS effects of microwaves are involved in the electromagnetic (centimeter wave) theory of extrasensory perception (3). This work, initiated in 1966, is being conducted for a special Bioinformation Section of the Scientific and Technical Society of Radiotechnology in Moscow. The results of Soviet ESP research have thus far been interesting but statistically inconclusive.

Both the stimulatory and inhibitory effects of microwaves on CNS function have been frequently documented by Soviet workers. Subbota (32) reported alternating arousal and drowsiness in response to microwaves in working with dogs. As mentioned earlier, the Soviet electrosleep expert, Ivanov-Muromskiy (27) concluded from his studies of human subjects that pulsed UHF fields could be used as a form of contactless electrosleep which he calls "radiosleep". Depression of mental function, inability to concentrate, and general sluggishness is frequently documented by Soviet and Eastern European researchers as a subjective response to microwave exposure.

Autonomic and Cardiovascular Responses

Reports of human autonomic and cardiovascular responses to microwaves are nearly as numerous as those documenting CNS responses to this factor (Table 6). Responses are noted for a wide range of frequencies at thermal and nonthermal field intensities and during acute and chronic exposure. Decreased EKG spike amplitudes have been noted by Drogichina (33) in subjects working around radiofrequency fields. Sadchikova (34) reported on various cardiovascular shifts in workers exposed to different field intensities (Table 7). Figar (15) and Smurova (35) have noted decreased coronary conductivity, sinusoidal arrythmia, brady- and tachycardia, and oscillating hypo- and hypertension. Monayenkova et al. (36) studied minute blood volume, peripheral resistance, average arterial pressure, and smooth muscle tonus using a mechanocardiograph. She found that a tendency toward hypertension, increased elasticity of myogenous vessels, increased precapillary resistance, sinus bradycardia, and changes in intracardiac conductivity were more often noted in exposed than in unexposed subjects. All of these changes were found to be reversible with one or two questionable exceptions.

There is some evidence that certain enzymes implicated in CNS function might be affected by exposure to microwaves (Table 8). Revuts'kyy et al. (37) found a change in the specific cholinesterase activity of erythrocytes in human whole blood with 13.56 and 23.75 MHz microwaves. The 13.56 MHz radiation was found to decrease blood histamine content while not altering cholinesterase activity. The 23.75 MHz radiation did not change blood histamine content but increased cholinesterase activity. Bartonicek et al. (38) surveyed the blood biochemistry of workers exposed to centimeter waves. Of a total of 27 blood sugar curves, 7 were flat, 7 were prediabetic, and four indicated slight glycosuria. The distribution of pyruvic and lactic acid and creatinine are shown in Table 9. Lactic acid was found to be decreased 2.5 times more than it was found to be increased. Roughly 75% of the subjects exposed to microwaves and examined by Bartonicek were reported to have prediabetic blood sugar curves. These metabolic shifts were attributed to autonomic dysregulation, possibly indicative to diencephalic lesions resulting from early exposure to centimeter

TABLE 7

Cardiovascular changes in subjects exposed to electromagnetic radiation (Sadchikova, 1964)

	EMF parameters	Exposure/control ratio		
Range	Field intensity	hypertonia	bradycardia	increase of QRS interval (up to 0.1 sec)
SHF	1-several mW/cm²	1.85	24.0	11.5
	1 mW/cm²	2.0	16.0	12.5
UHF	nonthermal	1.2	8.0	21.0
LF	tens to hundreds V/M	9.21	12.0	—
	hundreds to 1000 V/M	1.2	5.0	—
Percent incidence in controls		14%	3%	2%

waves. Gel'fon and Sadchikova (39) noted increased blood globulins in 50% of a group exposed to microwaves which indicated a shift in the albuminglobulin coefficient. Haski (40) noted slight changes in the levels of blood sugar, cholesterol, and lipids of healthy subjects exposed to microwaves. However, there was a pronounced decrease in all three categories when diabetics were exposed.

Hematopoietic and Biochemical Responses

Numerous human hematopoietic changes have been reported to result from exposure to microwave fields (Table 10). The severity of these changes range from minimal to significant. Sokolov (41) noted reticulocytosis in radar workers. Baranski (42) observed that a small drop in erythrocytes occurs in all people exposed to microwaves and that the phenomenon is related to the duration and severity of exposure. About 50% of the subjects examined by Baranski showed a moderate decrease in platelet count. Lysina (43) noted basophilic granularity of erythrocytes and was of the opinion that this index should be taken as an initial sign of microwave effects on the human organism. Presman et al. (44) found that the osmotic resistance of erythrocytes was negatively affected by microwaves. Smurova (22) and others found that the shape and volume of erythrocytes changes as a result of exposure to microwave fields. Prolonged exposure was occasionally noted to result in hemolytic processes. An increase in the RNA level of lymphocytes was also noted by Smurova in workers chronically exposed to microwaves; this finding corresponded to a concomitant increase in monocytes (young cells) which contain the greatest quantity RNA. Baranski (42) detected various leukocyte shifts in workers exposed for one year to microwaves. Normalization of this index was found to occur after prolonged exposure to this factor. He also found a tendency towards lymphocytosis with accompanying eosinophilia in subjects exposed for more than five years to low and moderate microwave intensities.

Soviet workers have also found biochemical changes to occur in other sites (8). A drop in RNA content was noted in the spleen, liver, and brain in animals chronically exposed to microwaves while DNA content was found to remain constant.

TABLE 8

Neurohumoral responses to radiofrequency electromagnetic radiation

1. Altered cholinesterase activity in human whole blood (erythrocytes)
2. Decrease in blood histamine content
3. Increase in blood proteins
4. Altered carbohydrate metabolism
5. Changes in blood sugar, cholesterol, and lipids (pronounced in diabetics)
6. Decreased hemoglobin

Ocular Responses

Changes in human ocular function and eye pathology are widely documented and occur primarily

TABLE 9

Distribution of pyruvic and lactic acid and creatinine excretions in workers exposed to microwaves

	Pyruvic acid		Lactic acid		Creatinine	
	number	%	number	%	number	%
No. of measurements	40	100.0	35	100.0	34	100.0
Normal	28	70.0	14	40.0	14	41.2
Increased	4	10.0	6	17.2	6	17.6
Lowered	8	20.0	15	42.8	14	41.2
Averages	0.77 mg%		14 mg%		1.33 mg%	
Controls	0.65 mg%		17 mg%		1.30 mg%	
Established standard	0.5—1.0		10—20		1.2—1.9	

after acute or chronic exposure to thermogenic microwave intensities (Table 11). As mentioned earlier, one Soviet worker (28) has reported that exposure to intense microwave fields was noted to cause hallucinations. Matuzov (29) found the area of the blind spot to decrease after exposure to nonthermogenic (10 cm; 1.1 mW/cm²) microwave field intensities. Other Soviet workers, as reported by Marha (8), have found that microwave radiation (a few mW/cm²) can cause a decrease in sensitivity to color (blue) and difficulty in detecting white objects. Changes in intraocular pressure have also been noted by Soviet workers as have altered sensitivity to light stimuli during exposure to pulsed and nonpulsed fields. General ocular pain, eye strain and fatigue, eyelid tremor, and lacrimation are also common symptoms noted by Soviet workers.

Pathological changes in the eye (cataracts) occur primarily as a result of exposure to thermogenic (greater than 10 mW/cm²) microwave intensities. Sadchikova (45) and other Soviet workers (6) have noted unilateral and bilateral cataracts to occur in subjects exposed to several mW/cm² field intensities. Presman (44) noted a drop in vitamin C content in the lens and anterior chamber fluid at nonthermogenic intensities. In the event of acute cataract development a decrease in ATP and pyrophosphatase activity of the lens was noted. In addition, it is suspected that damage to tissue respiration and oxidation mechanisms as a result of exposure to microwaves can lead to cataract formation.

There is some evidence that ocular responses to microwaves are frequency dependent. Pol (46) noted that 10 GHz fields caused anterior lens opacity while 2.45 GHz cause posterior opacity.

Belova (47) noted that in 370 microwave generator workers exposed to mW/cm², lacrimation, ocular fatigue, and frequent conjunctival irritation would occur at the end of each working day. Zydecki (48) suggested that all candidates for occupation around microwave sources receive comprehensive ophthalmological examinations. This suggests that certain ophthalomological profiles might be more vulnerable to microwave radiation than others.

TABLE 10

Hematopoietic and biochemical responses to electromagnetic radiation

1. Blood
   a. reticulocytosis
   b. basophilic granularity of erythrocytes
   c. decrease in erythrocytes, platelets and hemoglobin
   d. altered osmotic resistance of erythrocytes
   e. neutrophilic leukocytosis
   f. lymphocytosis, monocytosis, and eosinophilia
   g. increased RNA in lymphocytes
2. Organs
   a. Decreased RNA content in brain, liver, and spleen

Endocrine Responses

Damage to sex glands and functions have frequently been documented to occur after chronic exposure to primarily thermal microwave fields (Table 12). Marha (8) in reviewing Soviet and East European findings noted decreased spermatogenesis, altered sex ratio of births, changes in menstruation, retarded fetal development, congential effects in newborn babies, decreased lactation in nursing mothers, and other related responses to occur as a result of exposure to thermal (i.e., greater than 10 mW/cm^2) microwave intensities. Microwaves were also implicated in an increase in the percentage of miscarriages in both humans and animals. Some of these findings reported by Marha are consistent with subjective complaints reported by Soviet researchers such as decreased sex activity, mentioned earlier. Specific genetic changes resulting from exposure to either thermal or nonthermal microwave fields have yet to be demonstrated.

TABLE 11

Effects of electromagnetic radiation on the eye

1. Perceptual and function changes
   a. hallucinations
   b. decrease in size of blind spot
   c. decreased sensitivity to color (blue)
   d. difficulty in detection of white objects
   e. decreased sensitivity to light stimuli in dark adapted eye
   f. change in intraocular pressure
   g. lacrimation, ocular fatigue, and ocular pain
   h. trembling of the eyelids
   i. altered tissue respiration and oxidation-reduction processes
2. Pathological changes
   a. lens coagulation (cataracts)
   b. decrease in vitamin C content of lens and vitreous humor
   c. decrease in ATP and pyrophosphinatase activity
   d. anterior and posterior lens opacity
   e. conjunctival irritation

Soviet sources have reported pituitary and other endocrine responses to microwave exposure. Kolesnik (49) suggested that pituitary-hypophyseal-adrenal changes were primarily due to CNS influences on the hypophysis after exposure to microwaves. Drogichina (33, 50), Sadchikova (21, 34), and Smirnova (51) have reported thyroid gland enlargement and increased iodine-131 uptake. These changes suggest an increase in thyroid stimulating hormone (6). Hasik (40) and Presman (44) noted increased activity of the adrenal cortex to occur after microwave exposure. Murashov (52) studied 20 subjects occupationally exposed to UHF fields. He noted a reduction in plasma corticosteroid content which was attributed to lowered adrenal, or possibly sex gland androgenic activity.

TABLE 12

Endocrine responses to radiofrequency radiations

1. Sex organs and ontogenesis
   a. thermal trauma (tissue damage) to male reproductive tissues
   b. decreased spermatogenesis (sterility)
   c. altered sex ratio of births (more girls)
   d. altered menstrual activity
   e. altered fetal development
   f. decreased lactation in nursing mothers
2. Endocrine glands
   a. altered pituitary and pituitary-hypophyseal function (CNS)
   b. hyperthyroidism
   c. thyroid enlargement
   d. increased iodine-131 uptake
   e. increased adrenal cortex activity
   f. decreased corticosteroids in blood
   g. decreased glucocorticoidal activity

Miscellaneous Responses

Loshak (53) reported that various human responses, such as subjective complaints as a result of chronic microwave exposure, appeared to vary slightly with climate (Table 13). In general, responses to microwave fields were more pronounced in hot, dry climates. It was found that the electrical resistance of the skin of exposed workers was lower than in unexposed workers in a hot climate. Decreased resistance was attributed both to CNS stimulation or increased sympathetic tonus due to skin receptor reactions. These findings, while not dramatic, led Loshak to speculate that special hygienic considerations for workers exposed to microwaves in a hot climate should be exercised (improved ventilation etc.).

TABLE 13

Miscellaneous effects on electromagnetic radiation

1. Climatic effects
   a. responses to electromagnetic radiation more pronounced in hot climate
   b. decreased electrical resistance of skin in hot climate due to electromagnetic radiation
2. Internal Organs
   a. dyspepsia and epigastric pain
   b. decreased appetite
   c. liver enlargement

Exhibit B

A Sampling of Quotes from Comments by Injured Individuals Which Were Improperly Dismissed By FCC

Catherine was only able to review comments from the oldest portion of the docket down to page 25. In all, Catherine reviewed comments by over 170 injured individuals and over 115 concerned individuals, many of whom may just have failed to mention their injury.

1. **Susan D. Foster, MSW, Rancho Santa Fe, CA** https://ecfsapi.fcc.gov/file/7520941192.pdf

"2. I am a medical writer and the organizer of a brain study of California firefighters exposed to RF radiation from a cell tower adjacent to their fire station of over 5 years.

3. In 2004 I organized a pilot study of California firefighters who worked up to ninety (90) hours per week in fire stations with cell towers in close proximity to the two (2) stations where the firefighters work, eat, and sleep. The men were experiencing profound neurological symptoms following activation of the towers in 1999.

4. The symptoms experienced by the firefighters, all of whom had passed rigorous physical and cognitive exams prior to being hired by the fire department, included but were not limited to the following: headaches, extreme fatigue, sleep disruption, anesthesia-like sleep where the men woke up for 911 calls "as if they were drugged", inability to sleep, depression, anxiety, unexplained anger, getting lost on 911 calls in the town they grew up in, a twenty (20) year medic forgetting basic CPR in the midst of resuscitating a coronary victim, immune-suppression manifest in frequent colds and flu-like symptoms.

5. The neurological testing and SPECT scans [single-photon emission computed tomography] of the brain were conducted by Gunnar Heuser, MD, PhD and J. Michael Uszler, MD. All six (6) firefighters were found to have brain abnormalities on SPECT scan. The doctors thought they would find areas of limited function in the brain based on the symptomatology. Instead, they found a pervasive, hyper-excitability of the neurons which suggested the exposure to RF (microwave) radiation was causing the neurons to continually fire, without rest. RF radiation appeared to act as a constant stimulant even when the men were away from the station, and in repose. The SPECT scans were considered abnormal in all 6 firefighters.

6. Cognitive function, reaction time, and impulse control were measured objectively using T.O.V.A. testing [Test of Variables of Attention]. In all six (6) firefighters, impairment was found with cognitive function, reaction time and impulse control. Three (3) of the six (6) firefighters were captains. The captain on each shift is in charge of making life altering decisions for all firefighters and potential victims. They order firefighters into a burning building, and conversely, they order them out before a roof may collapse, for example. Impairment of all three critical functions could cost firefighters and the community they serve either life or limb.

7. The testing was conducted in 2004. The cell towers are in place at the two (2) fire stations where the test subjects work for the duration of a twenty-two (22) year lease. The men we tested have remained at the stations as this is the only work they know in the only community they have ever lived in. One (1) of the six (6) men tested did move to another department after his wife gave birth to an a boy who was diagnosed with Autism at age 2. This was the first live birth experienced by the "firefighter family" at this department since activation of the tower three (3) years earlier.
8. I have followed up with the firefighters who report continued symptoms as described in paragraph 4. Additionally, all firefighters report profound memory loss."

2. **Ann Lee MD, Palo Alto CA** https://www.fcc.gov/ecfs/filing/10930516619895
"I am a physician and my training is in physical medicine and rehabilitation. I have a son who was diagnosed with a heart murmur when he was five years old. This was found on a routine physical exam required for admission to public school. An echocardiogram confirmed he had a loose heart valve with regurgitation. My son had no symptoms at the time, so the cardiologist said we could just follow up if he developed any new symptoms in the future.

Two years later, my son started to complain of chest pain for the first time after visiting the second floor of a newly built library in Palo Alto for a tutoring session. This occurred every week when we visited his tutor at the library. We repeated his echocardiogram, which I suspected would show a worsening heart defect. To my surprise, it was normal. His cardiologist said the murmur had resolved and my son had the "heart of an athlete." When I asked what could have caused my son's chest pain, he said he wasn't sure and to come back if there were any worsening symptoms. My son was seven years old then.

The cardiologist's reply didn't satisfy my physician's or mother's instinct. I couldn't find anything in the medical textbooks about chest pain in children with structurally normal hearts, so I resolved to look online through pubmed as well as "google it." On the web, I found several studies which showed adverse biological effects from wireless radiation and reports of children experiencing unusual, sometimes generalized symptoms of nausea, headache, skin rashes and chest pain, etc. after their school installed WiFi routers in the classrooms.

I did some investigation and looked for routers in the library. On the floor where he used to get tutoring, there were seven routers on the ceiling and almost every adult there was accessing them wirelessly on their laptops. My son's school also had WiFi routers in every other classroom. However, he did not complain of chest pain at school. I decided we would avoid going to the library and leave it at that.

Then in April 2016, California public schools performed a standardized test. All the students in his classroom had to access the test using their laptops wirelessly. This was the first time he complained of experiencing chest pain at school. He was eight years old.

3. **Daniel Berman (63 years old), Psychotherapist, Portland, Oregon** https://ecfsapi.fcc.gov/file/7022311258.pdf

"Given that the scientific difficulty of proving X or Y is what is affecting one amongst the thousands of stimuli in the 21st century environment, I would urge you to consider: Why would there suddenly be so many normal, reasonable and sometimes outstandingly successful individuals, who have shown no sign of depression, and no lack of motivation for decades of their lives, suddenly make up these symptoms, uproot their lives, spend tens of thousands of dollars trying to successfully re-locate?"

"I have lived in dozens of places the last 4 years trying to find someplace comfortable for my body. Before that, I lived in the same house in Portland, Oregon from 1979 until 2008. My relatively normal life, as I knew it from birth to age 58, has been destroyed by "smart" meters and cell towers and wi-fi."

4. **Cynthia Edwards, Sales and Landscaping, Ann Arbor, MI** https://ecfsapi.fcc.gov/file/7022311409.pdf

"Once the meters started being installed in my city in 2012, I began having trouble sleeping, developed a loud ringing in my ears, started feeling exhausted all the time, have experienced brain fog and an inability to concentrate, and my irregular heartbeat that had been under control suddenly was wildly irregular, and nothing

has been able to stop it. This is terrifying because it predisposes me for a stroke or heart attack. All of this is putting my health and my life at risk. ... Several people in my community have had to move out of their houses because of becoming so ill after the meters were installed. Many others are now constantly ill. People's blood pressures have spiked and they have had to go on medication to control it. A young boy with juvenile diabetes, which had been completely under control, had his numbers spike into the danger zone. ALL OF THIS HAPPENED DIRECTLY AFTER SMART METERS WERE INSTALLED."

5. **Andrew Swerling, Computer consultant, Redmond, WA** https://ecfsapi.fcc.gov/file/7022311273.pdf

"Approximately a year ago, I began having symptoms of headaches, dizziness and nervous system problems. Like most people, I had a cordless phone and a wireless modem near my computer. I had no idea of the risks posed by these devices to my health. When I measured the EMR emitted by these devices, the readings were greater than 2,000 microwatts/m2 for each of these devices. As soon as I turned these devices off, I immediately started feeling better."

"I find it difficult to do my work since all of the computing devices I must use emit substantial amounts of EMR. I consider this a potential workplace hazard."

"I urge the FCC to adopt new RF safety guidelines that take into account published research on the biological effects brought on by the ability of RF signals to communicate with living tissue, and more specifically, to consider the Building Biology guidelines for human health. I further urge the FCC to work with OSHA to establish guidelines around workplace exposure for EMR."

6. **Craig Farver, Engineering Inspector, City of Fort Collins, CO** https://ecfsapi.fcc.gov/file/7022311404.pdf

"Lost my young Son, Rich from GBM Brain Cancer, October 2008. Dr. in California mentioned cell phone use. Rich, was also in a – Brain Cancer Cluster on the SDSU – San Diego State University campus. 7 people, 6 with brain cancers. A very powerful Governmental Cell tower directly outside of Nasatir Hall, Room 131. HPWREN."

7. **Zoltan Heisler** https://ecfsapi.fcc.gov/file/7520941921.pdf

"I am very much aware of the damage it has caused my own family by damaging my daughter- a very creative person, who was benefiting humanity by her profession as a psychotherapist. The installation of multiple smart meters as close as 10 feet away from her kitchen & bedroom wall has caused her to abandon her

living quarters, due to the effects of smart meters, such as burning, head pain, chest pain, irregular heartbeats. In addition to this hard to accept behavior by the power company, a large amount of these meters were installed in the building where she conducted her psychotherapy practice. For the same reason mentioned earlier, she had to give up her successful practice in addition to her home."

8. **Melody Graves** https://ecfsapi.fcc.gov/file/7520941369.pdf
"My symptoms began in late 2009 when I realized that every time I used my cell phone, I would get a bad headache. I realized shortly thereafter that my recurring headaches happened whenever I used a cell phone, wi-fi on my computer, or was near a person using a bluetooth hands-free device. I could not go into coffee houses with free wi-fi, because I started noticing a pattern of headaches and cardiac arrhythmia (heart palpitations) whenever I stayed in such an environment for more than a few minutes.

I stopped using my wireless router at home and hard-wired everything to a Cat-5 Ethernet network because I began to hear a machine-gun fire clicking noise at night when I was about to fall asleep. Later, after I educated myself on the dangers of RFR and purchased a high-frequency RF meter, I realized the clicking noises were the sound of the high-frequency microwave pulses coming from my wireless router, which are inaudible to most people except the RF sensitive. My sleeping improved tremendously, and the feeling of unrelenting fatigue and a lingering dull headache in the mornings was gone.

My health and sleeping improved dramatically until a smart meter was installed on my home without my consent when I was on vacation. Immediately, I noticed persistent migraine-type headaches whenever I worked in the kitchen, the side of the house where the smart meter was installed. During complete power failures, the headaches were non-existent and my body felt relaxed and able to rest. Now I avoid working in the kitchen for long periods unless I wear RF shielding garments, which help somewhat to mitigate my headaches and fatigue. .....

One of my clients has a 4 year old son with severe behavioral problems and learning challenges which completely disappeared after reducing his exposure to RFR and electrical fields inside the home. It makes me wonder how many other ADHD children and autism spectrum children could be helped by simple improvements in their RFR environment."

9. **Terilynn Langsev, Retired City Planner, Santa Barbara, CA** https://ecfsapi.fcc.gov/file/7520941852.pdf

“I personally have been struggling with effects of RF exposure since the proliferation of wireless technology and increased power of cell phone towers and transmissions. I experience adverse effects to my health way beyond heating up. I experience heart palpitations, muscle weakness. Severe ice pick to the head head aches, cogitative disorientation, the feeling of electricity running through my body, nervous system hyper stimulation, sleep problems, depression and anxiety during and after exposure to RF frequencies. It is getting increasingly difficult to live in the current environment.”

10. **Susan Lippman, 64, Austin, Texas** https://ecfsapi.fcc.gov/file/7520942061.pdf

“Moreover I have some personal friends who are electro-sensitive and who have had to retreat to a small town in Colorado. Even there, they cannot hide.”

“My husband’s first wife recently died of a brain cancer, and it was a terrible event for all concerned.”

“I hate to see that we are rapidly moving toward a wireless system so fast that we are losing our wired infrastructure.”

11. **Nanci Rose Gerler,** https://ecfsapi.fcc.gov/file/7520941749.pdf

“My life is now limited to the least exposure to the outside world. The multitude of “smart meters,” WIFI routers, cell towers and antennas, all other emitting systems and devices have made the life I loved, and city I love a nightmare for me. I struggle to maintain my health in a home that has been mitigated, at some expense to be safe for me.”

12. **Melissa Chalmers, Canadian** https://ecfsapi.fcc.gov/file/7520941445.pdf

“I was until last year a Captain on the A320 at an airline here in Canada. I became severely sensitive to all wireless after cell towers were placed behind my home in London, Ontario. I have since had to end my 22 year career because of this new sensitivity; unable to tolerate wireless devices on the aircraft, wi-fi in hotels, the terminal, etc.”

13. **Leslee Cooper, High Falls, NY** https://ecfsapi.fcc.gov/file/7520942007.pdf

“8. I call on the FCC, Congress, and the EPA to review all emerging science, to investigate citizen's complaints of harm, and to investigate a **possible connection between increased immunological and neuroendocrinological diseases and increased cumulative levels of radio frequency radiation in our environment.**

My family, myself, my neighbors have already experienced physical harm and because we cannot yet remove Smart Meters to stop or limit our exposures, we are suffering serious disease today and day after day. These are diseases that we did not have before the Smart Meters arrived and, in many cases, our doctors are saying that our conditions are rare or atypical.

When I purchased this home in 2008, I didn't understand that my water meter was already a "Smart" meter that emits pulsing microwave RF 24/7 constantly. In 2009, my local gas and electric company began to replace my surrounding neighbor's mechanical analog electric meters with pulsing microwave radio frequency Smart Meters without notice and without informed consent. Smart Meters are not approved devices in New York. In addition, New York State utilities claim that they are not using Smart Meters, but RF testing devices show that New York RF meters are pulsing on and off at high levels all day long - in many cases, at levels that exceed even the current RF standards. See attached document about Smart Meters in California entitled Assessmt_RF_microwave_smart_meter.pdf

Reports of Injury
8a. My neighbors across the street have two Smart Meters on their home. Exposure began when they moved in five years ago, but increased significantly in the last three years when the Smart Meters proliferated in our neighborhood. This family has developed the following medical conditions in the past two years: woman under 40 diagnosed with atypical Glaucoma, man under fifty diagnosed with atypical Grave's disease, child under four had benign tumor surgically removed. All have sleep disorders and agitation. None of these conditions were pre-existing and there is no family history on these.

8b. My neighbors next door have two Smart Meters in their home - first Smart Meter went in at the end of 2007, second in 2011...the wife now has a heart murmur and palpitations, is pre-diabetic, the husband has immune system irregularities. Their doctor can not figure out
4what is wrong and why they are not responding to treatment. No such medical history was present prior to 2007.

8c. My neighbor moved in four years ago. They have two Smart Meters, male under sixty years old has had two strokes - one two years ago and one one year ago.

8d. My home has one Smart Meter on my home and, as I explained, no other wireless technology. Please note that our Smart Meter is a water meter that emits

spikes of radiation that is lower than the spike RF levels from a standard GE Smart Meter). In the past three years, I have been diagnosed with microscopic colitis, heart palpitations, red blood cell irregularities, memory loss, TMJ, and sleep disorders and my husband has developed tinnitus, hearing loss and memory loss. We both turned fifty years old in this house.

8e. Worst of all, my 83 year old mother had a standard Smart Meter for electricity installed on her house and all of her neighbors' houses a few years ago. Her neighbors' Smart Meters are very close (<20 feet) and those meters are pointing right into my mother's bedroom and living room windows where she spends most of her time. My mother was fine (no neurological symptoms) until those meters went in. Now, the neurologists have diagnosed her with what they say is a very rare inflammatory brain disease called cerebral amyloid angiitis. She has big holes in her brain and has lost a lot of neurological function. The doctors say this is NOT typical of Alzheimer's, but -- for all we know -- the increases in Alzheimer's, Parkinson's, MS, ADHD, or even diabetes could be due to constant exposures to the always- on wireless RF technologies, such as the Smart Meters and DECT phones. We need to be investigating the rise in these diseases and any possible connections with RFRs.

14. **Kathryn K. Wesson Charlottesville, VA** https://ecfsapi.fcc.gov/file/7520942101.pdf

"Lenient radiofrequency exposure limits have caused health problems for my family, to the point where our long term health has been endangered and many aspects of our quality of life have been affected. I suspect this because we were a very healthy family until a smart meter was installed on our home."

15. Junghie Elky https://ecfsapi.fcc.gov/file/7520941893.pdf

"The current RFR exposure limits have impacted my well-being and caused me to experience health problems. I have had the experience of electro-sensitivity, which is basically being "allergic" to electromagnetic fields (EMFs) and man-made radio waves, with symptoms including dizziness, headaches, pains, including ear aches, and, most notably, fatigue, by being near them. I remember quite distinctly getting a headache in the back of my skull that lasted for many hours, even lingering until the next day, when my children were communicating wirelessly with each other on their Nintendo DSes in the car while I was driving. The head tightening came on when they started playing. I noticed the same headache when my daughter came walking in my direction while talking on the cell phone. I was not even aware she was on the cell phone (I was in a bedroom, when she came walking down the hallway). I used to sleep with a portable phone next to my bed,

but I would invariably wake up when my muscles on the top of my head would twitch and have spasms in the direction of the phone. My hand would have a shooting pain when even touching a cell phone. We used to have something plugged into our wireless router that would boost the wireless signal through our wiring. I felt sick and awful just to be inside the house without knowing why, until finally, I found out, through my husband, about this technology and unhooked it. Immediately, I felt better and could at least stand to be in my house. Being under fluorescent tubing would make feel dizzy and fatigued. These are just a couple of examples of how radio frequencies had adversely affected me at a time when I was especially sensitive."

16. **Jeraldine Peterson-Mark Nationally Certified Biodynamic Craniosacral Therapist and Licensed Massage Therapist, Santa Fe, NM** https://ecfsapi.fcc.gov/file/7520941797.pdf
"My health and immune system are challenged in environments that are overcrowded with modern electronic instruments such as cell phones, Wi-Fi, Bluetooth technology, high powered light fixtures, scanners and electronic medical devices. I become fatigued, irritable, headachy, confused and have even lost my balance on occasion. It is challenging for me to spend any length of time in shopping centers, airports, grocery stores, college campuses, movie theaters, restaurants, hotels or hospitals. Now, as more and more cell towers are being erected in my neighborhood, and neighbors are opting for Wi-Fi access, I am becoming more exhausted and un-well feeling living in my own home.

In November of 2010, I discovered quite by accident that my local gas company had installed an Automated Meter Reader (AMR) on my home's gas meter located on the wall outside of my bedroom window just 2 feet from the top of my head where I sleep. I suffered from insomnia, wheeziness, a metallic taste in my mouth, indigestion, brain fog and general aches and pains which were not the norm for me at the time. After requesting that the AMR be removed, all symptoms disappeared within 3 days."

17.**Ellen K. Marks, Lafayette, CA** https://ecfsapi.fcc.gov/file/7520941900.pdf
"My husband suffered a seizure and diagnosis of a glioma in 2008. 10 days later Senator Kennedy had a seizure and the same diagnosis. Our son had interned for Senator Kennedy and soon heard concerns from those in his office that the Senator's family felt his tumor was attributable to his long term cell phone use. Since that time many scientific experts, including neurosurgeons, have also stated that Kennedy's death was more likely than not due to his cell phone use."

18.**D Yourovski** https://ecfsapi.fcc.gov/file/7520942062.pdf
"Working in public schools in the computer labs, I have been taken out of the lab by wheelchair during a workshop from becoming dizzy, disoriented, slow of speech, and feeling extremely fatigued and my family called to come take to the doctor."

"...we need your help and support to protect our children, our citizens already disabled from electrical sensitivity and the rest of our citizens which would include you and your families from becoming affected and even disabled by the EMF exposure."

19.**Diane Schou, Greenbanks, WV** https://ecfsapi.fcc.gov/file/7520941739.pdf
"I became a victim from exposure. For me, electromagnetic radiation[x] triggered and still triggers headaches[xi], fatigue, a decreased ability to think clearly; writing or speaking words or numbers may be wrong; sometimes it hurts to think; and my vision changes. I became gluten intolerant, experienced chest pains, and began having elevated blood sugar levels[xii]. When I am not exposed, the pain and symptoms lessen or disappear, I can think clearly, blood sugar[xiii] levels drop to normal. If I can have time to recover (i.e. 3 months), some electromagnetic radiation in an environment can be tolerated for a short time (a few minutes, i.e. to quickly go into a store and hopefully make a purchase before accosted by electromagnetic radiation) – or a few days (to attend my father's funeral with my mother). Continued exposure produces more and more symptoms which seem to get worse with each exposure.[xiv]"

"My life has become severely isolated and includes avoiding exposure from wireless devices. I am physically harmed if I go into environments with electromagnetic radiation."

20.**Desiree Jaworski** https://ecfsapi.fcc.gov/file/7520941446.pdf
"I would like to tell you how wireless has impacted me. Three years ago I was barely able to sleep at night. ... I mentioned my sleeping problem to a friend. She told me she had experienced the same problem but had discovered it was from the wireless devices and once she turned them off she could sleep.

I realized that I had a wireless router installed six months earlier and it was next to the bedroom. I also had a DECT portable phone that was under the bedroom. I was able to borrow a radio frequency radiation meter and I saw that my radio frequency radiation readings were very strong. I eliminated both of these devices and went to a corded phone and a cabled computer and was able to sleep again without any

medicine. Since then I have found other people have this same problem and once they remove these wireless devices or turn them off a few hours before and keep them off while they sleep they are able to sleep through the night.

One other problem I had found with the wireless router, when I was using it, is that I had it next to my computer monitor and I would feel like I was a little woozy or experiencing "brain fog" when I was done using my computer. Once I eliminated this wireless router that feeling no longer occurred."

21. **James C Barton, Engineer, Peoria, IL** https://ecfsapi.fcc.gov/file/7520941418.pdf

My daughter is sensitive to electromagnetic radiation (EMR) and suffers intolerable symptoms when exposed to EMR. Her life is being destroyed. Because of all the time it takes to help her find a place where she can exist, my retirement is being destroyed. Because of her need to move to a place where she can exist, our family closeness has been destroyed. In order to get away from the many sources of EMR in the city, she moved to an old farm house in the country. Then a cell phone tower a mile and a half away was activated, and that house was no longer habitable. Then she moved to another state where she thought she had found a habitable home. ... Her home was an eight minute walk from my home. We often walked together for exercise after work. She liked to cook. Our families had Thanksgiving and Christmas dinners and some birthday celebrations at her home. Now she is hundreds of miles away at a place where we thought the EMR would be minimal, and we are on the search again because of the telephone DSL problem. ... During all of this, a near neighbor noted the many times the electrician's truck and numerous gas/electricity company trucks were at my daughter's house, and asked my daughter about it. My daughter told her the symptoms, and that they were trying to find the cause. The neighbor said they were having similar symptoms, and their young son had begun to have trouble doing his schoolwork. The neighbor's doctor had ordered an MRI for her, thinking she might have MS, but the results showed nothing. They tried what my daughter had been doing: sleep in the car in the countryside away from much of the EMR. They spent the summer sleeping in a tent in the yard of her parents' house in the country. When winter approached, they came back, spent a night in their house, and said "never again." They rented a basement in the country to spend the winter, sold their house, and then found a rental house in the country with minimal EMR. They were fine, and their son's schoolwork improved."

22. **Christine M. Hoch** https://ecfsapi.fcc.gov/file/7520941848.pdf

"I have experienced health effects from exposure to pulsed radiofrequency

radiation emitted from my cell phone and wireless laptop. In 2007, when I was working at home and using a cell phone for work purposes, I often had a headache, especially at the end of the day."

23. **Rebecca H, Former Healthcare Provider, Moraga, CA** https://ecfsapi.fcc.gov/file/7520942151.pdf

"It took 1 month for my life to be shattered by smart meters. The utility company installed sixteen by my home; within days, stabbing pain in my head, palpitations, arrhythmia, pressure in my chest,extreme insomnia began-- symptoms that did not occur when I was away from my home. Four others, 25 -80 years old, experienced similar symptoms in my home.

After one month, I thought I was having a heart attack. I moved out. These symptoms began occurring near other RF sources (cell towers, wifi.) Radiation injury from RF sources, like a severe sunburn, leaving the body over-reactive to touch, rendered me extremely sensitive to constant, subtler RF exposures in non-subtle ways."

"The number of people injured by smart meters is growing. We are enduring great losses--physical, emotional, financial, social and spiritual. I feel painwhen in stores/ office buildings/restaurants/ most social environments. My inability to work added to my medical expenses has cost hundreds of thousands of dollars. I am cut off from family and friends. I know professionals who sleep in their cars, sleep in tents in their backyards or in remote areas, people who can have little contact with their former lives, who cannot work or be near their loved ones. This situation amounts to a state of emergency for many people all around the US/ Europe."

24. **Rebecca Morr** https://ecfsapi.fcc.gov/file/7022311596.pdf

"A smart meter was installed on March 10, 2012. My reaction was so severe that I was not able to stay in my home. With a note from my doctor stating that it was making me ill, DTE finally replaced it with a non-transmitting digital meter, but DTE refused to install an analog meter, which my doctor had specified.

My symptoms were less severe with the replacement digital meter, but I still became symptomatic whenever I stayed in my home. My symptoms, including elevated blood pressure, ringing in my ears, muscle weakness, and breathing problems, would disappear when I left my home for an extended period of time, and reappear soon after returning to my home.

I have gone to great expense (thousands of dollars) in an attempt to bring my home

back to what it was prior to the installation of these meters, interventions ranging from hiring an electrician to upgrade the wiring in my home, to installing materials to shield my home from neighboring meters.

Each intervention has helped, and my home is now "livable," but my home has never returned to what it was prior to the smart meter deployment."

25. **Holly Manion, Real Estate Broker, Rancho Santa Fe, CA** https://ecfsapi.fcc.gov/file/7520940926.pdf

"On June 16, 2011 a man hired by San Diego Gas and Electric (SDGE) installed what he called was "an upgrade" to my Mother's utility meter. Following the installation of this utility meter upgrade, my Mother complained of a constant high pitched ringing in her ears, and she did not feel well. She felt lethargic; she complained about her vision; and she had a hard time with her speech and focus. Her legs, especially her feet became swollen. Within a week she fell for no apparent reason.

My brother, sisters and I take care of my Mother. These were very unusual symptoms for her. We could not figure out what was causing her declining health until she mentioned the man who had come by to upgrade her meter. I brought over my RF testing equipment and found that the RF bursts from the meters were every few minutes and extremely high. Readings were far in excess of what is allowable for total ambient surroundings of 1000~W/cm2. So we immediately removed the meter! Within a few days of the meter being removed, Mother's symptoms decreased, and she returned to her normal health."

26. **Alexandra Ansell, Medical Transcriptionist, W. Melbourne, FL** https://ecfsapi.fcc.gov/file/7022311585.pdf

"As a person who has been adversely affected and is subsequently now more sensitive to the effects of EMR, I personally appeal to you at the FCC not to ignore the multitude of studies and findings now available establishing nonthermal negative biological effects of RF radiation in the microwave spectrum and to immediately work to establish a realistic, biologically-based safety standard with public oversight backed by independent (non industry based/funded) experts."

27. **Alison Denning, Retired Educator, Mt Baldy, CA** https://ecfsapi.fcc.gov/file/7022311485.pdf

"Approximately a year ago, I began having symptoms of headaches, dizziness and nervous system problems. Like most people, I had a cordless phone, a cell phone. I also had a "smart meter". I had no idea of the risks posed by these devices to my

health. When I measured the EMR emitted by these devices, the readings were greater than 2,000 microwatts/m2 for each of these devices. As soon as I turned these devices off, and had the "smart meter" replaced with an analog meter I immediately started feeling better."

28. **Alan R. Marks, Real Estate, Lafayette, CA** https://ecfsapi.fcc.gov/file/7022311407.pdf

"I have a glioma that has been attributed more likely than not to my cell phone use. Had proper standards been in place and our government regulatory agencies controlled this properly instead of working alongside industry to intentionally mislead the public I and many others would not be suffering now. ... I am only one of many. I am the real data you need. This has destroyed my life and my family's life. Please do not continue to put millions in harms way needlessly."

29. **Angela Flynn, Kapa'a, HI** https://ecfsapi.fcc.gov/file/7022311138.pdf

"My health has been adversely effected by RF/MW exposure at levels that are permitted by the FCC MPE guidelines. I realized this while living in a home 300 feet from a cell tower. I found I could not sleep for more than four hours a night; suffered memory loss; suffered creaky joints; and, suffered from a whole body ache. I now go to great measures to minimize exposure to RF/MW in order to keep myself healthy. I have removed wireless transmitters from my home, utilized RF/MW shielding to keep outside sources from trespassing into my home and limit my time in the public at high exposure events."

30. **Theresa McCarthy, Administrative Assistant, Santee, CA** https://ecfsapi.fcc.gov/file/7022311625.pdf and https://ecfsapi.fcc.gov/file/7022311626.pdf

"I made changes: a) ordered removal of the Smart Meter attached to my home, b) ceased wireless internet connectivity within my home, c) ceased keeping my cell phone on my person, d) avoid locations with wifi connectivity as much as possible, and e) resorted to shutting off all energy power strips when any electrical unit's power is not in use within my home. ... The skin lesion which had appeared near my eye, vanished. My sleep pattern resolved and sense of normalcy returned versus the strange, constant, static nervousness, I had felt."

31. **Suzanne Morris, Marriage and Family Therapist, Kirkland, WA** https://ecfsapi.fcc.gov/file/7022311558.pdf

"Approximately a year and a half ago, I began having symptoms of dizziness and nervous system problems including tendonitis upon waking that cleared later in the day. Like most people I had a cordless phone system, a wireless modem, a cell

phone, fans in the summer, pole lamps and several computers in my home. I had no idea of the risks posed by these devices to my health. When I measured the EMR emitted by these devices, the readings were greater than 2,000 microwatts/m2 for each of these devices. I also started hearing a high pitched pulsing sound that was a consistent 60 beats per minute which an electrical engineer told me was the cycle for electricity. I got rid of wireless in my home and use my cell phone very judiciously leaving it off most of the time. I also started sleeping under a Faraday canopy because the RF off the cell tower across the street was way beyond the healthy levels that Building Biology has indicated. I immediately started feeling better."

32. **Sean Canton, Software Developer, Aptos, CA** https://ecfsapi.fcc.gov/file/7022311310.pdf

"I am a software developer who recently stopped working with a utilities services company which extensively utilized smart meter technology in the office place. After 8 months of working there, I developed tinnitus in the ear which was closest to the power closet, one that contained several wireless smart meters. This is an ongoing condition which greatly affects my productivity, happiness and sense of well being. ... I have noticed a direct correlation between an increase in tinnitus to proximity to smart meters installed on residences. I have viewed apartments which aggravate the condition in bedrooms and bathrooms, only to find that smart meters were installed directly outside the rooms in question."

33. **Sandra Storwick, licensed massage practitioner and home maker, Kirkland, WA** https://ecfsapi.fcc.gov/file/7022311299.pdf

"Approximately 20 years ago, I began having symptoms of headaches, dizziness and nervous system problems whenever I used or was in the proximity of cordless phones. I found that I experienced the same symptoms when I used a cell phone. I am unable to use wireless computers (my computer equipment is all wired and that poses no problem) . Now as the use cell phone technology, wifi and other wireless technology is becoming more wide spread, I am feeling more and more limited by what I can use and be around. I am extremely concerned about the use of wifi on airplanes as this means that now air travel will also be a challenge for me and others who are sensitive to electromagnetic radiation. I am unable to use toll bridges or freeways that use wireless radio wave tolling systems are so intense, it takes my body weeks to recover."

34. **Sandi Maurer, Founding member and Director of the EMF Safety Network, Sebastopol, CA** https://ecfsapi.fcc.gov/file/7022311294.pdf

"I have received hundreds of complaints from people who report they have been

harmed by wireless Smart Meters. In addition, I have taken tens of declarations from customers who state their health and lives have been seriously affected by Smart Meters.
The symptoms reported include:
Sleep problems (insomnia, difficulty falling asleep, night waking, nightmares)
Stress, agitation, anxiety, irritability Headaches, sharp pain or pressure in the head
Ringing in the ears, ear pain, high pitched ringing
Concentration, memory or learning problems
Fatigue, muscle or physical weakness
Disorientation, dizziness, or balance problems
Eye problems, including eye pain, pressure in the eyes,
Cardiac symptoms, heart palpitations, heart arrhythmias, chest pain
Leg cramps, or neuropathy
Arthritis, body pain, sharp, stabbing pains
Nausea, flu-like symptoms
Sinus problems, nose bleeds
Respiratory problems, cough, asthma
Skin rashes, facial flushing
Urinary problems
Endocrine disorders, thyroid problems, diabetes
High blood pressure
Changes in menstrual cycle
Hyperactivity or changes in children's behavior
Seizures
Recurrence of cancer"

And, from EMR Safety Network comment https://ecfsapi.fcc.gov/file/7520940667.pdf
"The following are selected quotes from the declarations.

> *"I am experiencing the following symptoms due to the radiation emitted from smart meters: headaches, tinnitus, insomnia, dizziness, nausea, vomiting, depression, and lethargy. My facial skin has also become extremely dry and rough, as if it has been burned...My daughter experiences the following symptoms due to smart meter radiation: chronic bloody noses and occasional headaches."*[6]
>
> "I was unaware that a Smart Meter had been installed on our house, but I suddenly began having severe, debilitating headaches, joint and muscle pain, muscle cramping, elevated blood pressure, irregular heartbeat, insomnia, and an intermittent buzzing/tingling sensation in my legs and feet that happened every

few seconds day and night, and I realized on checking with the electric company, that my symptoms began right after the Smart Meter was first installed. What further confirmed for me my suspicion that my symptoms were connected to the Smart Meter was the fact that my symptoms completely disappeared when I would go to stay a few days at my daughter's house in Marin County..."[7]

"Since the installation of SmartMeters in our neighborhood, I have suffered with tinnitus, muscle cramps, sleep disturbance, chronic fatigue, heart palpitations, migraines, blurred vision, and dizziness...When I visit my father in Shasta County who lives in an area where there are no SmartMeters as yet, the tinnitus stops completely. I sleep well and feel much better."[8]

"A Smart Meter was installed on my home over my objections in August 2010. At first I did not notice any ill effects, but over time symptoms began to accrue. By November 2011 I was suffering from insomnia, nosebleeds while sleeping, constant nausea, headaches, heart palpitations, fatigue, loss of balance, and depression. I called PG&E several times to request removal of the Smart Meter. They refused."[9]

Customers express concern for their health, the health of their children and for others welfare:

"After 10-15 minutes of exposure to one "Smart Meter" from a distance of 6 feet, I began to experience heart palpitations and felt physical distress so that I had to quickly move away as I feared for my health, the condition of my heart and my very life."[10]

"We fear for the stability of our daughter's health. She is chemically sensitive, which means that her immune system is compromised. Believing, as many medical people do, that sensitivity is probably triggered by an event of overexposure, we do not want to risk another problem."[11]

"My concerns for the Owner, the residents and my own family are Smart Meter-related fires, privacy invasion, expensive rates, over-billing, hacking of personal information, wiring overloads, dirty electricity, explosions and health impacts on all."[12]

Some customers experience physical suffering, and worsening of health conditions even though they don't have a Smart Meter on their home, but their neighborhood is deployed:

"Since Smart Meters were installed in my neighborhood I have experienced worsened tinnitus and worsened insomnia."[13]

"Since Smart Meters were installed in my neighborhood, my formerly very mild electrical sensitivity worsened significantly and rapidly. I experience insomnia, frequent headaches, worsened sinus disease, tinnitus, and such cognitive problems as poor short term memory, confusion, and disorganization".[14]

"I do not have a Smart Meter on my home, but I am surrounded by Smart Meters on my neighbors homes...Since Smart Meters were installed in my neighborhood I have experienced constant tinnitus, something I did not have before the meters were installed. I have also experienced otherwise-unexplained sleep disturbances."[15]

"Since the installation of my neighbors' smart meters in mid-2011 (my wife and I opted out of the smart meter program, but we are still affected by the smart meters in our neighborhood) I have suffered from daily heart palpitations, dizziness, headaches, worsened tinnitus, insomnia, and fatigue..."[16]

"Since deployment of Smart Meters in my neighborhood in late August, 2010, my symptoms of electrosensitivity have worsened, and I have lost the use of portions of my home and property because I must avoid proximity to neighborhood wireless Smart Meters."[17]

"Since Smart Meters were installed in my neighborhood I have experienced worsened anxiety, terrible headaches, and heart palpitations."[18]

Some customers have found the Smart Meter system intolerable and have been forced to relocate out of state.

"The effects of the Smart Meter were so debilitating for me that I have relocated to North Carolina, to an area where there are no Smart Meters."[19]

"We have since abandoned our house and California all together and relocated to Ann Arbor, Michigan where, sadly, the meters are now on their way. We are preparing to run again once they get to our neighborhood."[20]"

35. **Ruthie Glavinich** https://ecfsapi.fcc.gov/file/7022311590.pdf

"At the time of our exposure [to radiation from a cell tower] and to this date, my husband and I experience symptoms such as: Extreme pressure in the head, headaches, migraines, mood swings, anger, dizziness, pain behind the eye sockets, tinnitus, nausea, neck and back pain, joint pains, rapid heart beat, insomnia and fatigue when exposed to radio frequency radiation emitted by wireless technology such as: cell towers, SmartMeters, WI-FI and surveillance cameras."

36. **Robin Brooks, Graphic Designer, Fullerton, CA** https://ecfsapi.fcc.gov/file/7022311293.pdf

"My husband developed kidney cancer after several years of wearing his cell phone in a holder behind his right kidney. He also developed a brain tumor. Shortly after the Smart meter telephone poles were installed on my street, he died of unexplained heart failure."

37. **Rhonda Hoefs, Aptos, CA** https://ecfsapi.fcc.gov/file/7022311490.pdf

"Since SmartMeters went into our neighborhood the effects have been over-whelming. We have constant ringing in our house that affects sleep, concentration and thus health. I have documented this is detail in letters sent to the CPUC and my city."

38. **Patricia A. Ormsby, Translator and Teacher currently residing in Japan with a background in chemical engineering, Denver, CO** https://ecfsapi.fcc.gov/file/7022311580.pdf

"I became aware in 1996 of physiological effects of radiation from digital cellular telephone systems which impacted the health of one friend and then of myself. These effects were not from actually using a cellular telephone, but from being in the proximity of others using them, particularly in crowded, restricted spaces surrounded by metallic materials, such as trains and buses, or by proximity to base stations. The immediate effects in my case have been dizziness, headaches and disorientation, and the long-term effects have been memory loss, cardiac arrhythmia and immune dysfunction."

39. **Patricia Burke, Professionally Trained Yoga Practitioner with an Ivy League education, MA** https://ecfsapi.fcc.gov/file/7022311470.pdf

"In 2005, while living in Massachusetts, I moved to an apartment within walking distance of the yoga studio I had directed for almost a decade. Within weeks, I experienced declining health, including headaches, fatigue, poor sleep, poor digestion, tension, and extensive menstrual bleeding. The apartment was on the 3rd floor of a home 2 doors down from a church housing a cellphone antenna."

40. **Odessa Rae, Actress/Producer, Santa Monica, CA** https://ecfsapi.fcc.gov/file/7022311341.pdf

"Approximately a year ago Edison started installing Smart Meters in Santa Monica. I have never been particularly sensitive to radiation but this was so significant I noticed the difference right away. I was getting headaches and feeling very tired. My friends started having symptoms like headaches and chronic fatigue as well. I moved out of my house one month after the installation and I started feeling better right away. Utilities have received tens of thousands of similar reports from individuals just like myself, even though the chronic radiation exposure is far less than current FCC exposure limits there is obviously a miss match between health symptoms being experienced and what you are saying is safe."

41. **Nancy Naylor, Springboro, OH** https://ecfsapi.fcc.gov/file/7022311356.pdf

"I am the mother of a child with autism. ... There is considerable evidence, including Martha Herbert's section of the Bioinitiative Report that the biological effects of radiofrequency radiation exposure are very similar common biological markers of people with Autistic Spectrum Disorder (ASD). This is significant considering that there is increasing incidence of ASD among children as the exposure of RF radiation grows among the general population."

42. **Max Feingold, Software Engineer, Bellevue, WA** https://ecfsapi.fcc.gov/file/7022311483.pdf

"Over the last few years, I have become increasingly sensitive to the effects of electromagnetic radiation on my health and sense of well-being. I work at a computer for most of the day, and I used to work in environments where Wi-Fi networks were actively in use. I gradually began to develop headaches when remaining in these environments for sustained periods of time. I also had cordless phones, wireless keyboards and mice, and a Wi-Fi router at home. I had no idea of the risks posed by these devices to my health. When I measured the EMR emitted by these devices, the readings were greater than 2,000 microwatts/m2 for each of these devices. As soon as we turned these devices off, I began to feel better. I also began to sense the difference in my well-being between being in an environment with active Wi-Fi networks and one without. In general, we live in a world where we are increasingly bombarded with electro-magnetic radiation, and much of it is non-optional. Those of us who can feel it are not special – the negative effects are the same for everyone. Yet the electromagnetically sensitive are increasingly being pushed to the periphery of our society, because technologies that leverage EMR, in many cases needlessly, are becoming increasingly widespread. Please start working on fixing this problem."

43. **Reverend Annallys Goodwin-Landher, formerly Project Coordinator, Senior Data Technician, Chapel Hill, NC** https://ecfsapi.fcc.gov/file/7022311374.pdf

"I currently am on disability, unable to perform the complex daily tasks required to meet regulatory requirements needed when planning and implementing quality of life research in a medical setting. I believe the cognitive impairment, fatigue, and memory loss I experience was hastened and made worse by exposure to WIFI and RF radiation both at work and home."

44. **Beth Ann Tomek, Homemaker, Dallas, TX** https://ecfsapi.fcc.gov/file/7022311381.pdf

"A smart meter was installed at 5303 Brandenburg Ct. in September or October of 2012. I was not there at the time nor am I now. I'm temporarily living in a state where smart meters have not been installed. I have returned to 5303 Brandenburg Ct., my primary residence, on several occasions to visit. During these visits, I experienced headache, nervous system discomfort, neck pain, eye pressure, vertigo, restlessness, sleep disturbances, nausea and bowel discomfort. These symptoms eventually resolved once I left. My son visited on these same occasions, as well. He experienced flu-like symptoms of headache, neck pain, nausea, sleeplessness, body pain. These resolved upon leaving 5303 Brandenburg Ct."

45. **B.J. Arvin, Licensed Hair Stylist, Lake Havasu City, AZ** https://ecfsapi.fcc.gov/file/7022311612.pdf

"I do not need to reiterate the sources and research that I'm sure have already been presented to you, ad nauseam. I will simply explain the results of my living with four Smart Meters on the other side of my living room wall for ten months. They were already here when I moved into my four-plex apartment. I began to have the typical symptoms right away, before I'd ever heard of a Smart Meter. Hair loss, waking up hourly when I'd never had insomnia, headaches, ringing ears, foggy thinking, breaking out in a sweat in the air conditioned room, and a racing heart. One month after moving in I collapsed in the shower, unable to breathe when the room became humid, and ended up in the ER hospitalized, for the first time in my life. After a friend told me about these meters and I studied the issue, my landlord and I had to fight with the electric co. for months for the removal of these killer devices. My light bulbs kept burning out and the GFCI outlet kept tripping. My limit was reached one day when I bled out of many spots while shaving my legs. I finally had to threaten to buy my own analog meters and have an electrician install them, before the utility came out to put their own analog meters back on. But not before I suffered from what seems now to be a permanent problem with blood so

thin, the slightest bump causes a blood pool under my skin (photos). And this from a person who previously would not bruise, no matter how hard I slammed into something!"

46. **Catherine Ryan, Monterey, MA** https://ecfsapi.fcc.gov/file/7022311399.pdf
"Since 2006, with Wi-Fi and Smart Grid Network installed in my town, I and other members of our community are literally being tortured 24 hours a day by the dirty electricity riding on the power lines, as well as the signal of the 217Hz which is audible in my home, inside and out. It has caused much mental and physical stress, sleep deprivation, side effects such as headaches, nausea, constant hissing, humming, rumbling vibrating in my heads and body, and sleep deprivation. This was not present until the utility companies turned on the smart grid network ie. two way power line communication by using TWAC, PLC, BPL on the communication layer, necessary to maintain the global smart grid network. It is a daily living hell trying to maintain any type of normalcy, while being assaulted by the bio active frequencies leaking into our environment. I have no way to escape this hazards and no way to seek relief. It is a constant stressor. ... I have audio instrument evidence proving this audible noise is present; a constant modulating pulse everywhere in the air trespassing into every public and private space. ... When I complained to the phone company, a technician did a reading and found that power influence was in the danger zone at my home (over 90db). After he did line work, I asked that the test be repeated. It was not."

47. **Cynthia S Larson, Self-employed Writer with an AB degree in Physics from UC Berkeley and an MBA degree from San Francisco State University, Berkeley, CA** https://ecfsapi.fcc.gov/file/7022311189.pdf
"One day in October 2011, I noticed I had become inexplicably and strangely unwell for weeks that dragged into months. I wondered why I awoke every morning feeling mentally dull (foggy), dizzy with a sense of vertigo, and with nosebleeds, blurred vision, ringing in my ears, and migraine headaches when nothing in my life or routine had changed. I had not experienced any of these symptoms on a daily basis before individually, let alone all together at once each and every day. I wondered why when I was sitting and reading a book, my heart would often skip a beat, and bizarre muscle tremors would inexplicably spasm across muscles on my face, arms, legs, and all over my body as if I'd just been given an invisible electric shock. When I spent ten days away from my home and away from smart meters in Maui in November 2011, I was amazed at how much better I felt. Gone were all the symptoms. When I returned home, all the aforementioned symptoms returned, and I wondered what was causing them. ...The PG&E spokesman I reached on the phone read rather woodenly from

some kind of prewritten script, repeating over and over again how “smart meters are harmless.”...Eventually, this so- called “help” line staffer informed me that there was nothing I could do–there was no way (yet) to opt out. ... At the beginning of February 2012, I requested a smart meter opt-out from my local utility company, Pacific Gas & Electric (PG&E), on the very first day they offered such a program to the public, and exactly one week later on February 8, 2012, the gas and electric smart meters on my home were replaced with analog meters. While I still hear ringing in my ears and have increased sensitivity to my computer that I never had before, I’m now sleeping well and no longer waking up with nosebleeds and migraine headaches... and the heart palpitations, muscle spasms and blurred vision are a thing of the past.”

48. **Diana LeRoss, Technical Writer/Editor and Project Manager, Seattle, WA** https://ecfsapi.fcc.gov/file/7022311524.pdf

“Approximately seven years ago, I began experiencing skin and nervous system problems. I had a cordless phone, a cell phone, and a wireless modem. I had no idea of the risks posed by these devices to my health. When I measured the EMR emitted by these devices, the readings were greater than 2,000 microwatts/m2 for each of these devices. I must stay away from these devices in order to stay healthy. As well, my sensitivity increased to include fluorescent lights. If I use a cell phone for more than a few minutes, my skin burns. In order to use my computer, I must use an anti-radiation screen (3M now sells these). When I am exposed to fluorescent lights, I become nervous and anxious.”

49. **Elissa Michaud, Salesperson, Victoria, BC Canada** https://ecfsapi.fcc.gov/file/7022311372.pdf

“I lived in a home where unbeknown to me, the local electrical company had "upgraded" the analogue meter to a smart meter. During 3 years there I experienced insomnia, buzzing sensations that could best be described as internal shaking or vibrations, heart palpitations and tachycardia, ringing in my ears, memory loss, trouble thinking, concentrating, dizziness, and varying degrees of fatigue. I was prescribed thyroid medication by my doctor as an attempt to hedge a possible subclinical thyroid issue. Near the end of the three years, I began to have brief episodes of shooting blood pressure. I didn't know that the smart meter had been installed prior to moving in until just a few weeks before moving.

It's important to state that I had not experienced any of these symptoms before and prior to the time the smart meter and was healthy 39 year old who follows a very healthy organic eating, vegetable juicing and daily exercise lifestyle (walking, yoga, cycling, running) a non-smoker, non-drinker with no prior health conditions,

surgeries, medications, or accidents. ... Within a few days of moving from that home the symptoms began to subside. In my new residence, I could not see smart meters anywhere in the vicinity of my apartment unit. After a few weeks most symptoms were partially to completely gone. And after a several more months the lingering symptoms began to improve memory had improved considerably after the six month mark and the erratic heart rate episodes were gone. During that time, while still experiencing heart irregularities, I took, besides a complete (plus) blood work test - several cardiology tests, including ultrasounds, EEG, Holter test and all were normal. ...

In July of 2012 I moved into a rental that has a smart meter at the base of the stairs. After just a little over a month I began to experience a few of and a very mild variation of the symptoms experienced before - mostly the ear ringing and vague fatigue. But around the 4.5 month mark, I began an increase in minor heart irregularities, fatigue and memory issues. When I leave the apartment, after being out in my car or outside (not in a coffee shop wi-fi or other wi-fi area), it takes anywhere from 15 - 30 minutes to a few hours, but the symptoms gradually subside, I can relax and think clearly.

In January 2013 I took a trip to California, where I rented a sublet that unknown to me beforehand had 8 - 10 smart meters in a group for the apartment complex about 15 - 20 feet from the door. By the end of 3 weeks, several of the more troublesome symptoms re-appeared- the loud ringing ears, feeling of inner shaking/vibrating, dizziness, insomnia and varying heart irregularities (much more severe in nature) as well as memory and concentration issues. When I would leave the apartment for a time, the harsh symptoms would subside, followed by fatigue and recovery.

After vacating the short-term rental it took 3-4 days for all of the symptoms to subside. It seems the closer I am to the devices and the longer time spent in proximity, the more severe the symptoms and the longer recovery. However each time this happens, I am left with an obvious sensitivity to wireless systems ..."

50. **Ella Elman, Forest Ecologist, Bellevue, WA** https://ecfsapi.fcc.gov/file/7022311301.pdf

"Approximately a year ago, I began having symptoms of headaches, dizziness and nervous system problems. Like most people, I had a cordless phone and a wireless modem near my computer. I had no idea of the risks posed by these devices to my health. When I measured the EMR emitted by these devices, the readings were greater than 2,000 microwatts/m2 for each of these devices. As soon as I turned these devices off, I immediately started feeling better. Due to my prolonged

exposure to EMF from wireless, cordless phones and other sources, I am unable to be in spaces with strong sources of EMF. As a result, I have a real disability, as I am no longer able to work in most office environments (which have wireless) and cannot use a computer for long periods of time."

51. **Jayne G. Cagle, Yoga and Meditation Instructor Chattanooga, TN** https://ecfsapi.fcc.gov/file/7022311218.pdf

"In March 2012, I began having symptoms of extreme and constant headaches, daily heart palpitations, sleeplessness and nervous system problems like irrational irritability. Unlike most people, my husband and I had already hardwired the internet system in our home including the TV access to the internet. We replaced all cordless phones in the house with regular 'land-line' style wiring. I was already in the habit of not holding my cell phone to my head as it would cause headaches; preferring rather to use the speaker option on the phone. I generally walk around with my cell phone off unless I need it. While using the GPS option in the car, it is wired to an auxiliary line in the car's electrical system. I limit the amount of time I am exposed to computers, TV's and any wifi systems when possible. Because I had an idea of the risks posed by these devices to my health, we fought to have the smart meter removed from our house; replacing it with an analog meter. On Wednesday March 14, 2012, the instant the smart meter was disconnected, the headache stopped. Within 2 nights, restful (deep) sleep patterns began to return and I have not experienced one heart palpitation since."

52. **Jennifer Zmarzlik, Disabled with nerve damage, Madison Heights, MI** https://ecfsapi.fcc.gov/file/7022311477.pdf

"I am unable to be in direct contact or near any wireless devices without extreme pain occurring. ... I physically sense when I am near a wireless device. My skin and nervous system begins a burning sensation that does not go away until I am away from the device near me. At this point, almost all citizens use cell phones, wireless computers, and smart meter technology and there isn't any way to keep myself away from them."

53. **Jeraldine Peterson-Mark, Nationally Certified Biodynamic Craniosacral Therapist and Licensed Massage Therapist, Santa Fe, NM** https://ecfsapi.fcc.gov/file/7022311363.pdf

"My health and immune system are challenged in environments that are overcrowded with modern electronic instruments such as cell phones, Wi-Fi, Bluetooth technology, high powered light fixtures, scanners and electronic medical devices. I become fatigued, irritable, headachy, confused and have even lost my balance on occasion. It is challenging for me to spend any length of time in

shopping centers, airports, grocery stores, college campuses, movie theaters, restaurants, hotels or hospitals. Now, as more and more cell towers are being erected in my neighborhood, and neighbors are opting for Wi-Fi access, I am becoming more exhausted and un-well feeling living in my own home.

In November of 2010, I discovered quite by accident that my local gas company had installed an Automated Meter Reader (AMR) on my home's gas meter located on the wall outside of my bedroom window just 2 feet from the top of my head where I sleep. I suffered from insomnia, wheeziness, a metallic taste in my mouth, indigestion, brain fog and general aches and pains which were not the norm for me at the time. After requesting that the AMR be removed, all symptoms disappeared within 3 days.

54. **Josh Finley, Graduate student in Environmental Engineering at the University of Washington, Seattle, WA** https://ecfsapi.fcc.gov/file/7022311292.pdf

"I am negatively affected by exposure to the microwave radiation emitted by wireless technology. Effects I experience from exposure include an inability to think clearly, anxiety, headache, dizziness, and nausea. The extent to which I experience these effects generally increases as a function of both my proximity to the emission source and the length of time for which I am exposed. The effect also varies depending on the emission source characteristics, including carrier frequency, power density, and modulation signal, and does not seem to be linearly related to power density alone. For example, I am typically more severely affected by wi-fi signals than by those utilized by older cellphones. After exposure, a recovery period is required for me to regain physical and mental equilibrium. ... The fact that I experience these effects from microwave radiation affects almost every aspect of my life. It plays an important role in determining where I can live, where I can work, and where I can spend my free time. I am compelled by necessity to seek out "holes" in wireless infrastructure in which to live my life. Such holes are getting smaller all the time, and the presence RF in the environment already severely restricts my freedom and negatively impacts my health and wellbeing."

55. **Justin Padgett, Real Estate Broker, San Marcos, TX** https://ecfsapi.fcc.gov/file/7022311291.pdf

"Approximately two years ago, I began having symptoms of headaches, dizziness and nervous system problems. Like most people, I had a cordless phone and a wireless modem near my computer. I had no idea of the risks posed by these devices to my health. When I measured the EMR emitted by these devices, the

readings were greater than 2,000 microwatts/m2 for each of these devices. As soon as I turned these devices off, I immediately started feeling better. I have a smart meter that at times registers high levels of EMR. This has affected and killed my palm tree by EMR surges. The Cedar Elm tree that I have nearby has cancerous nodules. I have headaches when I sit very long in the window that is closest to my meter. I am part American Indian and it is my understanding that we are extra sensitive to EMR as well as women. I have reconfigured my devices and made the appropriate steps in my house to protect myself. I cannot however replace my meter."

56. **LaShanda Summerlin, Office Administrator, Fort Hood, TX** https://ecfsapi.fcc.gov/file/7022311213.pdf

"Approximately a year ago, I began having symptoms of headaches, dizziness and nervous system problems. Like most people, I had a cordless phone and a wireless modem near my computer. I had no idea of the risks posed by these devices to my health. My husband has also displayed sensitivity to electromagnetic radiation with these same symptoms. He has been having sharp pains in his head for over a year now. After several trips to the doctor, without remedy, he continued to have pain. My daughter, whose room in next to ours, has also suffered from headaches and nausea. My daughter was diagnosed with Crohn's disease January 2012, which we also were told from her pediatrician that the disease has dramatically increased in recent years. The medical community has no answer as to why this is so. The doctors were puzzled as it did not seem to be hereditary as in all other cases. Upon further research, I see that EMR is especially damaging to stomach and gastrointestinal areas. These findings cause me and my family great concern. Once we did research on the smart meters and took measures to distance ourselves from our bedroom where the meter is located, turned off wireless equipment in our home we began to feel some relief. I beg of you to PLEASE reconsider the damage that this has been proving to cause for millions of American families."

57. **Louise Kiehl Stanphill, Small Business Owner, Santa Rosa, CA** https://ecfsapi.fcc.gov/file/7022311562.pdf

"In 2009, I suffered a severe electrical shock to my head while talking on a cell phone plugged into a wall socket. Since that event, I have become hypersensitive to electromagnetic fields and suffer great physical pain when near wireless devices including cell phones, cell phone towers, cordless phones, wireless routers and wireless utility meters ("Smart Meters"); many electronics including household appliances, computers and television screens; and fluorescent lighting, especially compact fluorescent lights (CFL's). The proliferation of wireless technology has excluded me from activities of daily living, including worshiping, traveling,

attending public activities and events, shopping, etc., and has ruined my functional ability to work."

58. **Margaret T. Patton, Retired Journalist and Editor, Wayland, MA** https://ecfsapi.fcc.gov/file/7022311345.pdf
"In the Summer of 2007, NStar attached a wireless electric meter on the outside of my living room wall against my explicate instructions for the company not to place any wireless meter on my home. Since that time, I cannot concentrate on writing, as it is very difficult to compose any kind of meaningful article or letter. I have a history of always sleeping through the night, but since 2007, I have been constantly awakened in the night and unable to go back to sleep."

59. **Marsha Carter, RN, Abilene, TX** https://ecfsapi.fcc.gov/file/7022311375.pdf
"Not long after the [transmitting electrical utility] meter was installed, my thinking became fuzzy. I had a difficult time understanding what I was reading, following any one task or making decisions because I couldn't seem to follow the thought process required to do so."

60. **Mark Zehfus, Public Library Deputy Director, Sheboygan, WI** https://ecfsapi.fcc.gov/file/7022311584.pdf
"My wife is being hurt from the growing wireless radiofrequency exposures. This hurts both of us as a couple, since my wife cannot go to the places we enjoy, like restaurants, concerts, etc. that we did before. We can't visit family, stay in motels with WiFi or travel to places with a lot of wireless emissions, such as citywide broadband and cell towers, or she becomes ill.

What is missing in FCC standards is consideration of people affected by lower levels of wireless RF. Seems like standards should protect everyone including wives, children, elders, etc. FCC should adopt lower standards that protect people like my dear wife. I want her back. I want our life together back."

61. **Julie Ostoich, Photographer and Graphic artist at the University of California Davis Medical Center, Sacramento, California** https://ecfsapi.fcc.gov/file/7022311480.pdf
"The recent forced installation of smart meters in my neighborhood that are sending RF signals between 13,000 to over 200,000 times a day is affecting my well being and causing alarming symptoms for family members and myself. ... Since the installation of smart meters, I have been suffering with migraine like headaches and episodes of sharp stabbing pains in my head as well as extreme sleep disruption, tinnitus (high-pitched ringing or buzzing in the ears), heart

palpitations and arrhythmias, chronic fatigue, muscle cramps, irritability, and difficulty with memory and concentration. My 14-year-old son has also complained of symptoms. He has learning difficulties that I believe are being impacted by the RF from smart meters and other EMF emitting technologies. RF exposure has been found to alter over 140 proteins necessary for brain function and linked to ADD/ADHD, dementia, memory deficits and brain tumors. The meter on our house is located on the outside wall of my son's bedroom near his bed where he sleeps."

62. **Leslie Panzica-Glapa, Landscaper, Dexter, Michigan** https://ecfsapi.fcc.gov/file/7022311207.pdf

"I continued to call and call and call them and said, "Please take this [smart] meter off my house. I can't sleep, I can't work." I called at 3 a.m. one night when I couldn't sleep. Like the first representative, this representative said he'd never heard of such a problem. I finally set up a tent in my backyard, after weeks of not sleeping. I slept really well, not quite as well as when I was sleeping in my own bed in my own home before I had a smart meter, but no one sleeps quite as well in a tent as in their own bed. It has been very stormy and windy this last month, and about three weeks ago the tent blew over on me at about 3 a.m. It covered me so thoroughly, and was so heavy, I thought I was going to suffocate! ... I moved back into my house because every time I set the tent up, it blew back down the winds were so high. My nights are now sleepless. ... At night, I lie there feeling a vibration going through all of my body and my ears ring loudly. Landscaping is really hard work, and I wonder some days how I am going to make it. The sleep deprivation makes me extremely fatigued and worn out. Day after day after day of exhaustion has made me feel suicidal at times. I just don't know how I can keep going on! I have felt such a fatigue and depression. This is totally affecting my personality and thus my friendships and other relationships. This is affecting my productivity at work – I am so tired! My memory has been affected – I will be talking to a person and totally go blank and can't finish my sentence. I have pain in my body I haven't had before—I feel an achiness around my joints. This has been progressive."

63. **Joshua Hart, Director of Stop Smart Meters!, Davenport, CA** https://ecfsapi.fcc.gov/file/7022311496.pdf

"I have personally been "sensitized" to RF radiation by exposure to a bank of smart meters. Since exposure I now develop symptoms such as headache and nausea when exposed to cell phones, towers, wi-fi and smart meters. That FCC limits on RF radiation could allow such powerful radiation as to create sensitivity

where there was none is direct evidence that the guidelines are outdated and irrelevant to the goal of protecting human health”

64. **Anonymous** https://ecfsapi.fcc.gov/file/7520940707.pdf
“I have had to leave several jobs because of wi-fi. Cell phones give me a headache and cause me disorientation if I am exposed at arm's length for more than a few seconds. Good sleep has become impossible for me unless I use protective netting to shield myself.

The symptoms I experience around wi-fi, tablets and cell phones include heart palpitations, tightness in the chest leading to difficulty breathing, and muscular weakness; not to mention a befuddling of the mind, irritability and forgetfulness.

When I am in an area that is relatively free of RF, for example certain parts of the countryside, I feel well and strong, bright and happy.

I am currently looking for a new place to live to avoid wi-fi. It is a nightmare. Anywhere suitable is way beyond my budget. I am highly qualified and have a very good work ethic, but have been forced to work in menial jobs that pay very little, just to get away from wi-fi.”

65. **Brent Dalton (about his wife’s experience)** https://ecfsapi.fcc.gov/file/7520940814.pdf
“Within 2 weeks of moving into an urban apartment in Richmond, Virginia, she started to have symptoms of burning in the head, headaches, dizziness, forgetfulness, fatigue, extreme pain throughout her body, and muscle twitching and tightness. After our own investigation, we found there was a bank of "Smart Meter" electric meters that emitted RF frequencies from the local utility company near our apartment. We also found out that a store below us was using a wireless router and the signal was emitting from it 24 hours a day. The apartment management company allowed us to move a little further away from the bank of meters into another apartment. Even though she found some relief with some symptoms, she was still in pain from the wireless routers from the neighbors.

We then moved to a rural area into a house away from neighbors. She improved greatly but still had some pain. We wondered why. Keep in mind she does not have a cell phone. We have hardwired computer lines and do not allow any type of wireless technology into our home. After investigating around the house, we found that the electric meter was a digital meter that had an RF emitting device on it, so the meter could be read by up to 7 miles. After consulting with the power company,

and supplying them with a Doctors letter, they removed it and put on a meter that had no RF emitting device. Once it was removed her symptoms began to improve. She now feels safe in our home however, when she leaves the house and gets close to this RF technology, she starts to have these symptoms again. We have also lost income from her business because she cannot work due to the symptoms she feels when around this RF technology."

66. **Deirdre Mazzetto, Registered Nurse, Reno, NV** https://ecfsapi.fcc.gov/file/7520938505.pdf

"Since I was unaware of any potential health risks associated with this device, and grossly under informed by NV Energy, I said "yes" to the installation. I have not had one night of fitful sleep since that day, and neither has my 23-month-old daughter. I am plagued by headaches bilaterally in my temple areas during the day and at night. The headaches at night seem to be associated with a pressure against my eardrums and head. Along with the pressure are distinct ringing tones or tinnitus. Some tones are higher pitched, and there are several different layers within the high-pitched tones. At times, I also hear a low humming sound that oscillates. It is virtually impossible to sleep with the noises, pressure, and headaches. I have never had these symptoms before the installation of the smart meters, and when I am in nature where there are no homes or buildings nearby, the symptoms are alleviated within hours. ... In addition, my 23-month-old daughter tosses and turns all night. She is unable to get the proper rest and deep sleep her developing body needs. Unfortunately, she is unable to verbalize yet whether she has any other symptoms, such as headaches or tinnitus. But I am able to determine that she is not getting adequate rest due to an unusual grogginess and fatigue during the day that she did not have before."

67. **Diane Langley, Elementary School Teacher, White River Junction, VT** https://ecfsapi.fcc.gov/file/7520940731.pdf

"The current RFR exposure limits have impacted my wellbeing and caused me to experience health problems. I experience atrial fibrillation when I am exposed longer than a few minutes to these wireless radio frequency waves. My heart rate increases, and my heartbeat becomes irregular. I begin to sweat profusely. This impacts my ability to walk or exert myself even mildly and I am often too weak to function normally.

I first realized this when my family installed a wireless router for our internet connection. My incidence of atrial fibrillation (afib) increased drastically. Months later, I learned that radio frequency waves can affect health. When I began to experience atrial fibrillation, I turned of the router, and the afib went away.

I did this several times, many not realizing that the router was on, experiencing the onset of afib, and then checking to make sure it was off, and finding that it was left on. Now we keep the router off, turning it on for a few minutes at a time."

68. **Garril Page, San Anselmo, CA** https://ecfsapi.fcc.gov/file/7520940483.pdf
"In my own experience, I find I am sickened to a point of being unable to attend meetings at the Board of Supervisors, the CPUC, local agencies, and other venues such as stores, markets, even outdoor celebrations, where Wifi and RF signals and transmissions are unrestricted. I first notice a sharp and blinding headache, my eyes feel pressure, then my skin reddens and begins to swell. Next comes nausea and finally, my heart rhythms are affected. I find being so limited in where I can go and in what I can participate very-unAmerican. Per No. 09-5761 Heartwood, Inc., et al. v. Agpaoa, et al. I challenge the current exposure guidelines because I have suffered an 'injury in fact' that is concrete and particularized; is actual or imminent; is traceable to wireless exposure; and it is likely that this injury will be redressed by lower exposure guidelines. ... The FCC may not be a health and safety agency, but if you solicit comment, you indicate an intention to read what is sent you. ... Further, this proceeding requires a NEPA assessment due to reports of injury traceable to radiofrequency (RF) exposure under existing guidelines, which establishing biologically-based RF safety limits would prevent."

69. **Helen Sears, Port Angeles, WA** https://ecfsapi.fcc.gov/file/7520940700.pdf
"Port Angeles, WA installed one of the nation's first citywide wi-fi systems. When half of it was turned on, I couldn't get to sleep until 4:30 a.m., then slept until a little after 7 a.m. That was it. A day later, the rest of it was activated, and that night I got no sleep at all. In addition, I was constantly dizzy, light-headed, and couldn't keep a focused thought in my head. It was terrifying.

How did I know when the system was activated? My husband was on the Citizens Utility Advisory Committee and was present at all the meetings when the time was agreed upon. How did I know I had a problem with wi-fi? Several months beforehand, we got a router and plugged it in next to a desk in our bedroom, which was big enough it also contained the study. From that time, I couldn't get to sleep. As an experiment, we simply unplugged the router at bedtime, and the sleep problem disappeared.

We had just paid off our house the month before and planned to live in Port Angeles the rest of our lives. However, my reaction was so severe ... my husband rented ... a room outside Port Angeles ... where I could stay until we could sell our wonderful house and move.

We were allowed to move into our new cottage in Mendocino. CA the night before close of escrow, but I felt dizzy, unable to concentrate, and couldn't sleep that night at all. The next morning, I found a "smart" meter on the outside of the garage, even though we'd been told "smart" meters had been banned in Mendocino. We found out the supervisors had approved them, in spite of local dissent. Fortunately, there was an opt-out available, so we paid $75 for ourselves and our neighbors (only one close neighbor), to remove the meters, and continue to pay $10/month for us and $10/month for our neighbors to keep this uninvited and debilitating technology away. (Our neighbors reported having strange headaches and sleep disturbances, though their symptoms were not as severe as mine.)

My system is now much more sensitive to EMR of all kinds than it was in the beginning."

70.**Jackie Seward** https://ecfsapi.fcc.gov/file/7520940734.pdf
"My interest and concern with the so called Smart Meters came about as a result of spending two years searching for the cause of a total failure of my health forcing me to go from working full time at a demanding job which I loved to a total collapse in the presence of anything wireless.

In this two year period of time I experienced headaches which became debilitating headaches, increasingly loud ringing and buzzing in my ears which now includes a sore on one ear that breaks out when I am within 10 feet of a Smart Meter, along with concentration and memory difficulties which eventually forced me to give up driving an automobile. I have neuropathy much like a person who had extensive chemotherapy and require prescription pain medication. I also have thyroid problems resulting in total exhaustion, diagnosed as Chronic Fatigue, as well as chronic high blood pressure after a lifetime of very low blood pressure. I have also had emergency surgery for a torn retina that my optometrist had no explanation for other than radiation exposure. I now have a bulge on the other retina which is a precursor to the tearing which required the urgent surgery 3 months after the installation of the Smart Meter January 4, 2011."

71.**James Baker** https://ecfsapi.fcc.gov/file/7520939596.pdf
"I am one of the millions of people who have been harmed from RF/MW exposure from our wireless communications transmitters. ... I, for example, had a close encounter with cellular antennas located on a building. I developed muscle aches, memory loss and insomnia during this exposure. I was able to make the connection and now go to great lengths to avoid being in the vicinity of RF/MW transmitters

in order to stay healthy and functioning. This includes quitting my job and moving from my home. It also includes avoiding homes and businesses that have RF/MW transmitters."

72. **James E. Peden, Retired, Torrance, CA** https://ecfsapi.fcc.gov/file/7022311703.pdf
"I have had some unintended effects due to the current safety guidelines including trouble sleeping and headaches. These effects happened just after SCE installed a RF emitting smart meter on my house."

73. **Jamie Lehman** https://ecfsapi.fcc.gov/file/7520923577.pdf
"I had serious central nervous system injury and was hospitalized due to pulsed radio frequency via utility SmartMeters. I began to develop a stutter, my memory was failing, I had heart attack symptoms, my internal organs began to heat up and felt like they would explode, I received shocks to my head and metal on my teeth, lost control of my bladder after walking up to a Smart Meter, had severe insomnia, chronic bronchial infection, numbness and tingling in my extremities, and extreme anxiety just to name a few of my symptoms. Our electric Smart Meter was removed, but I was not able to begin to function again at our home until two neighbors removed their electric Smart Meters. Nine months later, I have still not fully recovered."

74. **Jane van Tamelen, Los Altos Hills, CA** https://ecfsapi.fcc.gov/file/7022424998.pdf
"A "Smart Meter" was installed in our home near my mother's bedroom with no explanation or warning of the possible radiation dangers. About a year later she was diagnosed with breast cancer and had to have a mastectomy. We had to pay a fee to have the meter removed."

75. **JAWood, Architect, Greenbank, WV** https://ecfsapi.fcc.gov/file/7520940136.pdf
"I was a healthy, licensed architect working in Honolulu, Hawaii when I became severely ill from wireless radiation poisoning and nearly died. I went from 117 pounds to 77 pounds in a couple of months in 1996. Cell phone use and cell phone towers proliferated commercially at this time. I was forced to leave my job as Chief Architect for Student Housing Projects at the University of Hawaii and travel to the US Mainland for medical treatment. Eventually I became so sensitized to microwave radiation from cell phone towers ... that I had to seek refuge in a quiet zone in West Virginia. ... when I came to this area and lived on a farm in a hollow without electricity or cell phone reception I began to gain weight and physically

improve. I was 82 pounds when I first came to the quiet zone in 2011 and am now 130 pounds.)"

76.**Jeromy Johnson San Francisco, CA** https://ecfsapi.fcc.gov/file/7022311655.pdf
"My wife and I were both harmed when a bank of wireless smart meters were put into our building, next to our bedroom. I can no longer use or be around wireless technology without headaches, tinnitus and heart palpitations. These smart meters supposedly met FCC guidelines. However, we were harmed by the devices. That this is happening to thousands of people across the country shows that current FCC guidelines are highly inadequate."

77.**John Grieco, Simi Valley, CA** https://ecfsapi.fcc.gov/file/7520937675.pdf
"We sleep within 12 feet of a meter installed last year and since installation I toss and turn all night. My heart races, my legs twitch, and my ears ring!

I can't take it anymore. The lack of sleep and my health are deteriorating rapidly. I want this RF emitting device off the house - now!"

78.**Lisa M. Stakes** https://ecfsapi.fcc.gov/file/7022423985.pdf
"I don't think that it is understood what a nightmare this is for some people including myself. When I'm near a wireless router for WiFi I have numerous symptoms including headache, stabbing pains in my head, heart palpitations, nausea, tightness in my chest, the shakes, and dizziness. These symptoms get more severe the longer I am around it. It is debilitating. I have the same symptoms when I'm near a cell tower, as well as high tension wires.

This makes it almost impossible for me to find a job, due to WiFi being in most places. In fact, I had to quit a job last year when WiFi was put into the shop I was working at. It makes it almost impossible to find a rental. I can not rent in an apartment building or a duplex. I can only live in a house that is sufficient distance from other dwellings due to the WiFi signal coming from almost every home. I work on a computer by hard-wiring it to my internet connection. Then I have to take into consideration the placement of cell towers and high tension power lines. This is truly a nightmare for me."

79.**Michelle Miller, 37 years old, Northeast Ohio** https://ecfsapi.fcc.gov/file/7520923460.pdf
"Until recently I have lived an active very happy life. I love hobbies like karate, running, working out, laughing, jokes, and spending quality time with my family

and friends. For over 18 years I have worked with great people in local Government and truly love what I do for a living. The rest of this letter I will explain how and why my whole world has been thrown upside down.

Less than a year ago I got my first 4 G “smart phone”. I was so excited. I had the whole world at a touch of a button. I never went anywhere without it. We were inseparable. I would probably go to work without my pants before I did without my phone. I noticed that if I used it for awhile, my hand would tingle and go numb. I just thought it was maybe the way I held the device... I changed hand positions....but all had the same outcome....numb tingling hands. Sometimes while talking on it I would even get a sharp stabbing pain like a brain cramp in my skull. I kept my phone in the bedroom and suddenly I had trouble sleeping. When I would finally fall asleep from total exhaustion I had terrible dreams. I also started suffering from anxiety attacks. I would feel as though my heart was beating and thumping out of my chest and my lungs failed to gain to air. My life was beyond happy... a matter of fact the happiest I have ever been. So why the anxiety? ...

I tried to move on with my life, though I started to struggle as I found myself exhausted, depressed for no reason, anxiety constantly haunting me, and a mind that never shut down. I was in my thirties and for the first time was showing signs of ADHD. Single tasks became difficult because my mind failed to stay idle long enough for me to complete or comprehend before it was off in another direction. Things took longer and I was making mistakes that I never had before. I was forgetting so many things and I was known for having a memory of an elephant, now it was more like a pea. Running and working out was now just too hard. I was too exhausted. I overall just had an overwhelming feeling of being “unwell”. And my worse loss...I lost my ability to love life and LAUGH. It took all I had to just survive and fake a smile. ...

A mutual friend of my fiancé mentioned he had been doing research on RF exposure. After a little research of my own, I removed my wireless WIFI router (hard wired my computer to the internet), removed cordless phones, and barely use my cell phone and kept it out of my bedroom at night. Unfortunately, I have no power to control the unconstitutional radiation that is spewing out from the smart meter on our water & gas meters! At this point, I am going to be honest.... I was still very skeptical. My fiancé also suffers from crippling headaches after being struck in the head by over 200,000 volts of static electricity years back. I figured it would be a double bonus if it helped him too. It was as though lightening struck me as the realization hit me with such force. I was sleeping at night, my mind and memory seemed much better, and the anxiety, heart arrhythmias, and depression

were finally lifting. Though at work I did feel a little less improved due to the WIFI and RF exposure, but overall was feeling better. At least I was sleeping at night, and my body and mind felt "relaxed" when I was at home which seemed to assist my body with dealing with the exposure at work. And the double bonus, my fiancé was finally getting some relief from his headaches. ...

Then my world crashed. I came into work one day and my head started to split. The pain radiated down into my jaw, across my face and into my ears with unexplained dizzy spells .I could feel my heart was beating all over the place. I could not even concentrate. Co-workers began to notice that something was defiantly wrong with me. My headache would become so severe I would become light sensitive and my eyes blood shot. The job I loved so much became my private hell. Something in this place was killing me. I would notice that when I would get home my symptoms would improve. What had changed here? Thinking it was maybe allergies (though I have never suffered from allergies) from the AC ducts I made an appointment for a complete physical with my doctor the following week. The pain grew more severe with passing days and I became very aware it was not displaying symptoms of allergies. Why would I feel so much better when I left this place? I noticed that certain parts of the building would affect me so badly I had to avoid them because I would become so dizzy and the pain would stab my head like a sharp knife. I started to ask questions. I asked my Department Director and she asked our Maintenance Supervisor, neither of which knew what had changed. After asking our Tech Department, I was told that our Cell Tower (that is literally almost connected to our building) had been upgraded (they increased the number of frequencies). My pain correlated almost exactly when work had finished on our tower. The parts of the building I was forced to avoid were the parts CLOSEST to the tower. ...

Every day is a struggle me. Some days more than others. The job I love so much has become a private hell for me. I shroud myself in very costly (at my own expense) protective shielding clothing for whatever little relief it offers me while I work. My once flawless skin on my face is now flawed by a burning rash that appears every day when I report to work. The headaches and jaw pain are now a chronic issue any time I am exposed to RF, and now I have a screeching in my ears when around the cell tower at work. I am sadly aware that the job I love so much is taking so very much away from me now."

80.**Peggy McDonald, Texas** https://ecfsapi.fcc.gov/file/7022424213.pdf
"For two years I was ill. Then I discovered that about the same time I got ill, the power company had put in a "Smart Meter" right across the wall from my bed

where I spent 24/7. I also was sleeping next to my "Smart phone" and my DECT phone. I finally got a meter and the RF exposure I was getting was enormous. I disconnected the DECT phone and got a wired phone and turned off my cell and have tried to screen the "Smart Meter" ... Since I have disconnected and shielded myself I am almost functional again. It is my belief it almost destroyed my health."

81. **Richard Wolfson** https://ecfsapi.fcc.gov/file/7022424253.pdf
"I get headaches when I go near a cell tower, a smart meter, a cordless phone base station, a wi-fi router, or other RF transmitter. I do not use a cell phone for this reason. The headache can last a few days, and is very uncomfortable."

82. **Robert E. Peden, Network Specialist, Torrance, CA** https://ecfsapi.fcc.gov/file/7022311700.pdf
"I have had some adverse, unintended effects due to the current safety guidelines – primarily tinnitus and trouble sleeping. These effects occurred shortly after the installation of a RF emitting smart meter by my electric utility, SCE."

83. Robert S Weinhold, Colorado City, CO https://ecfsapi.fcc.gov/file/7520939713.pdf
"I have become severely disabled by wireless emissions, and am now extremely vulnerable to both wireless and a range of wired emission sources.

The first major blow came in March 2011 when my electrical utility provider installed a wireless smart meter on my house. Within 15 minutes I began to have debilitating symptoms (muddled thinking, jitteriness, overall weakness and head pressure) even though I was inside my house 30-40 feet away from the meter. After a couple hours, it was clear that this set of symptoms, which I'd never had before, were a major problem. Within 5 hours of the installation, my utility responded to my ardent pleading and removed the smart meter and put my old meter back on. ... It took me about two months to recover, but all of the unavoidable exposures since then (even though I have no wireless devices in my own home, and work very hard at minimizing exposures while in other settings) have continued to wear down my body's defenses. I now can't tolerate emissions from any computer or phone (wired or wireless), my radio, my TV, my electric oven, or electric razor. This is all extraordinarily limiting of course, since I have become unemployed due to my condition and can have very little interaction with the rest of society. It is devastating."

84. **Veronica Zrnchik, Saint John, IN** https://ecfsapi.fcc.gov/file/7520939862.pdf

“I am writing because I have been damaged by radiofrequency radiation. I developed radio wave sickness after moving into a new home that had two smart meters on it. I became sensitive to all things that transmit a radiofrequency--wifi, cell phone, microwave, video games, cordless speakers, lap top computer.

The sensitivity got so severe that I experienced severe discomfort when even driving past a cell phone tower. I am now painfully aware of all the cell phone towers where we just built our new home. Prior to the sensitivity, I didn’t even notice the sheer number of towers by my home. Now, it seems like I can feel every tower and transmission.”

“My children complain of headaches since we have moved near these towers and are forced to be exposed to wifi in the classroom. Unfortunately I cannot protect them from exposure that is involuntary and my duty as a parent is to protect my child.”

85.**Bernice Nathanson** https://ecfsapi.fcc.gov/file/7520941898.pdf
“Our daughter has been SEVERELY injured by the installation of smart meters. She is only one of thousands of people in the U.S. who have experienced this pain and suffering, due to the radiation in the smart meters. As a result, she and countless others experience severe pain with exposure to EMFs and RFs. They cannot be in the presence of wi-fi, satellite tv or internet, cell towers or use their cell phones, fluorescent lighting, etc. She has been suffering over three years with severe pain in her chest, head, and feels currents of radiation in her throat and torso, all day and night. She is kept from sleeping for 4 to 6 hours/night as a result of the severe pain. This started in the summer of 2010. It is now over three years later and she is still suffering daily and cannot find a safe place— pain free – to live, far enough away from RF sources. She is a psychotherapist. She had to close down her medical practice over three years ago and has no way of earning a living.”

86.**Ian Greenberg** https://ecfsapi.fcc.gov/file/7520941515.pdf
“I am a regular citizen like yourself, but I suffer from Electrical Hypersensitivity, which causes me to react with symptoms like chest pain, rapid heartbeat, dizziness, memory loss and headaches every time I am around electro-magnetic fields (EMF), particularly around wireless devices and wireless signals. ... At the end of 2012, I could not take it anymore and I literally slammed the front door and drove 2000 miles across the country to a small town in rural Arizona. I am not around wireless signals anymore and my health has improved dramatically.”

87.**Linda Hart** https://ecfsapi.fcc.gov/file/7520941309.pdf
“The current RFR exposure limits have impacted my well-being and caused me to experience health problems. I have for 20 years had to avoid wireless devices such as Wi-Fi and cordless phones in the home. Their presence always induced an inability to concentrate and deep brain fog. When a smart meter was attached to my house I immediately experienced an inability to mentally focus and exhaustion. Upon continued exposure this developed into a deep inner ear pressure, heat, and pain. I had to camp out away from my home for months until I could get an opt out option in which the transmitting module was removed.”

88.**Liz Menkes** https://ecfsapi.fcc.gov/file/7520940896.pdf
“The current radio frequency exposure limits have caused me to experience health problems. I moved to my new home in July of 2012. I opted out of my own smart meter as a precaution, and I have no other wireless in my home (no corded phone, no wireless router, etc.) Shortly after moving in, I noticed that my blood pressure spiked. It had consistently been about 120/70 but I was now getting 140-150/80-90. I assumed it was stress from the move. I tried different things over the next few months-- I exercised more, lost 5 pounds, focused on my diet, but nothing made a difference. This went on for 8 months. Then I saw a documentary on smart meters and realized how powerful they are (max peak signal strength of 250 uW/cm2). My neighbor's smart meter is about 12 feet from both my bedroom and my home office. I paid my neighbor the fees required to opt out. About a week after their smart meter was replaced by an analog meter, my blood pressure was back to normal-- 120/68. I believe that the smart meter was responsible for my spike in blood pressure.”

89.**Melinda Wilson, Snowflake, AZ** https://ecfsapi.fcc.gov/file/7520940587.pdf
“I have been injured by RF radiation that complies with current exposure limits.

In November 2008 I had just moved into a 9th Floor apartment between Harvard and M.I.T.

The third or fourth time I sat at the living room window and looked out at the view, after about 20 minutes I felt like I had been on a cell phone for about 2 hours.

I moved from the window and over to the other end of the apartment and the feeling went away.

However, later that day when I tried to use my cell phone it felt very uncomfortable.

Soon I could no longer use my cell phone at all without extreme disorientation and headache.

I was able to move to the 4th Floor but the damage had been done. I am no longer able to use a computer, stay under fluorescent lights, and can no longer work around electronics.

I had to leave the city because I could find no place to live where I was not overexposed to wireless frequencies.

Now I live in rural Arizona but they are building new cell phone towers and exposure is increasing again.

Please lower your exposure limits to protect the vulnerable of my generation and new generations."

90.**MK Hickox, San Francisco, CA** https://ecfsapi.fcc.gov/file/7520941466.pdf
"On a personal level, I am finding I am more stressed overall because: exposure to all the 24x7 microwave radiation (especially in San Francisco) makes it harder to concentrate, stay focused and I am more fatigued, experiencing more memory loss, easily distracted, experiencing inflammation--meaning that I am more sensitive to dust, toxins, smog and find it harder to sleep deeply. Overall, this microwave radiation exposure stresses the body on a number of levels and there are many, many studies to back this up. This past weekend I spent two blissful evenings away from San Francisco in Lake Tahoe, far away from all the massive big city microwave radiation and I slept so much better, feeling much more rested in the morning without being exposed to the nearby towers and smart meters from both neighbors', my house and WiFi."

91.**Patricia Fisken** https://ecfsapi.fcc.gov/file/7520940506.pdf
"I owned a beautiful home on three acres near the top of a hill in Vermont, and lived there for 25 years, where our two children were raised. After a microwave tower providing a wireless internet service was placed on the roof of a neighbor's home, I decided to move because my health was affected. I became dizzy and had headaches when I went outside to enjoy my yard and garden.

After the move my health issues disappeared. Just recently, almost two years later, I had the courage to drive back to see my old home. Within minutes I developed a severe headache, which lasted several hours after I left the hillside immediately.

In my new home I have no wireless internet or phone service (I use a Comcast wired service). In my office at work (a university) I have disabled any wireless devices or features connected to my computer. I have no problems with headaches in these environments. I have gotten headaches when in a room of people using wireless devices (such as iPads), sitting next to other people using wireless devices in buses and airplanes, and when I drive past cell towers located near highways in cities."

92.**Paul Vonharnish** https://ecfsapi.fcc.gov/file/7520940591.pdf
"It would appear I have been highly sensitive to electromagnetic radiation my entire life, thus spent the majority of my years in school experiencing severe and debilitating headaches, extreme fatigue, stomach disorders, and chronic depression. The flickering and hum of fluorescent lighting used to drive me crazy, and I hated attending school as a result. I usually felt better during the summer, and headaches and muscle weakness would subside within a few weeks of summer vacation."

"The most significant damage to my neurological system occurred as a result of exposures whilst living directly under a radio and television tower complex in Shoreview Minnesota, from 1990 thru 1997. I had a friend at the time that was an FCC licensed individual in the electronics repair business. In the course of a conversation regarding the constant ringing in my ears, he stated that such high-powered antenna complexes required a 2-mile setback from residential areas in the (now former) Soviet Union. Yet in the United States, we build high density housing right across the street from such a facility. The FCC was obviously negligent in this regard.

I moved away from Shoreview Minnesota in 1997, specifically to get away from these radio and television emissions, as I had gradually become aware that these towers were seriously affecting my health. The health of neighbors also declined, and many were being diagnosed with high blood pressure, heart attacks, unexplained neurological disorders, and several cases of terminal cancer."

93.**Susan Molloy, Snowflake, AZ** https://ecfsapi.fcc.gov/file/7520940580.pdf
"I have been injured by RF radiation that complies with current exposure limits.

I was forced to leave my home, graduate school, work, relationships, church and pretty nearly all the rest of my life in 1992.

I was then living just north of San Francisco, and was made ill repeatedly by Sutro Tower and numerous other exposures to EMFs and radio frequency. I had migraine, and frequently experienced a seizure-like disorder which made walking difficult so I frequently had no choice but to stay home.

I moved to the remote high desert in Northern Arizona, where I have been able to recover substantially by avoiding exposures.

Avoidance is becoming harder even here because new cell towers are being erected all the time.

It's very common for me to receive inquiries from people all over the U.S. who need to find a place to live where they can avoid RF exposures.

I receive many dozens of inquiries per year from people who are newly sickened by RF.

The frequency of these new inquiries has increased steadily over the years."

94. **Terry Losansky, Snoqualmie, WA** https://ecfsapi.fcc.gov/file/7520940799.pdf
"I am a software architect with a Bachelor of Science in Computer Science, a strong background in physics, twenty years of professional experience, and fifteen more years as an enthusiast of science, technology, computers and history. I have both a professional and personal understanding of the 'digital revolution'. It is with this experience that I have come to the conclusion the current RFR standards, practices, and enforcement in the use of wireless technologies have become a danger to public health, and is comparable to Tobacco, DDT, Lead, and Asbestos."

"[M]y wife began to learn about 'Radiowave Sickness' or 'Electro-Hypersensitivity'. I was skeptical at first, but we took steps to make more changes in our home environment. We removed the cordless DECT phones. We turned off our cellphones at night and when not needed during the day. We disabled Wi-Fi in our home and used only wired internet access. We turned the power off at night. My wife had some minor positive results at first, but this did not last. She still felt better when we left the area.

We had our home evaluated for Electromagnetic Radiation sources. It became apparent the neighborhood itself was the source of the problem, with every home having several 'smart meters', most neighbors now using Wi-Fi for internet access and cordless phones in several rooms and baby monitors, local cellphone towers, and the local elementary school – a few hundred feet away – using Wi-Fi throughout the school. There was nowhere in the community that did not have a significant level of RFR exposure, a state which did not exist when we purchased the home twelve years before.We were forced to sell our home of twelve years, virtually abandoning it in December 2012, to go stay with family as my wife's health began to plummet. The cost of further changes to our home to protect ourselves was too costly and would not protect us in our own yard, let alone the neighborhood."

"Since the sale of our home, we have lived in our motor home traveling from one RV park to another, staying in remote areas where we are most distant from the modern wireless 'conveniences'. We home school our daughter to reduce involuntary exposure to the constant Wi-Fi in the schools."

95.**Jim and Jana May, Temecula, CA** https://www.fcc.gov/ecfs/filing/6017339268

Brief Comment "The wireless emissions limits are currently too high. For me and my wife, a Sprint cell tower was erected about 1000 feet from our home a number of years ago. During the two years before we could move, my wife became very sick and I became sensitive to wireless transmissions of any kind. My wife got headaches, blood pressure increase, dizziness and tiredness. I got headaches. After we sold our home and escaped, we moved into a lovely home with a view. After a couple of healthy years, a cell tower was erected about a mile from us with no other home barriers because we are on a hill. My wife?s symptoms started again, and when the wireless smart meters were added to our neighborhood, we both became very sick and are getting sicker. By this I mean that our sleep is disturbed and the quality of sleep has deteriorated significantly and we are suffering from chronic sleep deprivation and all the things my wife had previously experienced. We also have major headaches and depression and just don't feel good. And unfortunately there is no way to hide because smart meters and cell towers are everywhere."

96.**Jessie Ellis, Lebanon, NH** https://www.fcc.gov/ecfs/filing/6017339272

Brief Comment "The installation of the new smart meter on my previous home's water line caused me severe illness immediately, and in following months almost killed me. I developed life threatening heart, respiratory and digestive problems,

causing me to become far underweight (under 100 lbs), and severely electrically sensitive- so much so I could no longer drive my car, along with many other limitations. Even after my Doctor helped to have the smart meter removed, my illness (though not as severe) was still very compromised by nearby smart meters. I had to move from my home of many years, to stay alive, and lose much of my savings. This nightmare experience continues on, since many people who are sickened by these meters cannot appreciably recover- I'm one of them.If you care about yourself, family, any people at all, then take action to correct this terrible wrong!"

97. **Kathleen Christofferson, Orfordville, WI** https://ecfsapi.fcc.gov/file/7520941118.pdf

Brief Comment

"I ask that you investigate the effects of wireless technology on the central nervous system and make radiation exposure limits more restrictive. In the past 5 years, wireless technology has triggered debilitating migraines and severely limited the places I can go. Seven years ago, after purchasing a new cordless phone, I realized that using it for more than a few minutes at a time triggered a migraine. I tried several different models and manufacturers with the same result. I now use a speaker phone or rotary model. I can no longer visit my elderly parents because their apartment complex has wireless internet. Before this was installed, I had no ill effects after being in their home. The same situation has occurred at my dentist's office after their suburb received wireless internet. Although it is inconvenient, I can change dentists and limit the places I go. However, deciding whether to visit my parents at their home or accepting 3 days of pain and nausea is a major problem. I know there are many people affected in much the same way I am with some having much worse symptoms."

98.**Elizabeth Feudale** https://ecfsapi.fcc.gov/file/7520941099.pdf

"Is it really necessary for me to slowly die at 57 years of age in agonizing and unbearable pain just so that people can have faster and faster phones and computers and we can be monitored for our water and electric usage? Does my husband really have to watch me suffer day after day eventually watching his young wife being lowered into the ground so people can speedily read a minute by minute , blow by blow account of every time a celebrity visits a rest room? You are directly responsible for mine and many other's suffering and you can put a stop to it by accepting the non industry generated science about radiation and the human body and putting tougher regulations on the amount of radiation allowable to be transmitted by these devices and cell towers. Today approximately 3+% of the population are suffering as I am, but the number will most definitely grow as you

allow higher and higher amounts of radiation to penetrate the bodies of the public. And what of us 3%?"

99.**Layna Berman, Sebastopol, CA** https://ecfsapi.fcc.gov/file/7520940914.pdf
Brief Comment "I am a health educator and syndicated radio journalist covering the health consequences of microwave wireless, non ionizing radiation for the last fourteen years. I have interviewed researchers,and public policy makers on the topic from across the globe, and read research going back to the1960s There is no doubt in my mind of harm both to the environment and to humans. I get new calls daily from people who are getting ill after receiving a smart meter or with the installation of a cellular tower near their home. In addition, I am now getting ill as well, and can no longer travel to highly populated urban environments without feeling poorly. I'm experiencing the same symptoms of insomnia, heart irregularities, low blood pressure, high resting pulse, headaches, stomach distress and body aches as the people who call me regularly."

100.**Jaime Schunkewitz, Electrical and Biomedical Engineer, Califon, NJ**
https://www.fcc.gov/ecfs/filing/6017465561
"My life has been ruined by a severe case of electromagnetic hypersensitivity (EHS). I get a severe headache, chest pains, tinnitus, ear pain, and eventually flu-like symptoms from exposure to low frequency 60 Hz all the way to RF. Cell phones cause an acute, immediate reaction which lasts for days, or weeks depending on the length and strength of exposure. I was injured by using a cell phone and CRT monitors."

101. **Carl Hilliard, Irvine, CA** https://www.fcc.gov/ecfs/filing/6017339279
"I get immediate headaches when passing near smart meters Some of them are instant and intense until I move away. While I understand that I may be sensitive to RF, I am more concerned about my 5 children that don't seem to be effected and thus fail to remove themselves from the danger. Further to allow the UTILITY to charge for keeping an analog meter is most egregious."

102. **Ronald Jorstad, Newman, CA** https://ecfsapi.fcc.gov/file/7520940753.pdf
Brief Comment "PG&E installed a Smart Meter April 2009. About 2011, I started to feel sick. My joints in the hands and lower back pain began to hurt, I had numbness in my lower legs. I also started to have bloody nose bouts when I would go in the kitchen or living room where the Smart Meter was located on the other side of the wall. In 2012, I had the chance to Opt-Out from the Smart Meter program and DID Opt-Out. About 2-months later my symptoms began to go, and I am feeling much better than the last two years."

103. **Sue Martin, Fairfield, CA** https://ecfsapi.fcc.gov/file/7520940958.pdf
Brief Comment "I experience many different types of symptoms when exposed to RF. Most are debilitating. It has become necessary for me to search for land to buy that has less RF in order to feel human again. Some of the symptoms are: Extreme fatigue, the feeling that gravity has greatly increased, causing the sensation of compression on my body, nausea, brain fog, changes in handwriting, memory loss, aphasia, insomnia, tingling and a feeling of vibration throughout my whole body. I'm greatly restricted in the following because of effects of wifi, cell phones, and cell phone towers. Shopping - almost all shopping is now done online. Visiting family - Every one has wifi and cell phones. Traveling - motels and airports have wifi. Camping - most campsites have wifi."

104. **Victoria Jewett Santa Fe, NM** https://ecfsapi.fcc.gov/file/7520940628.pdf
Brief Comment "Current FCC limits for human exposure to radio frequency radiation are already set way too high. I am unable to tolerate the proliferation of 4G technology, especially the 4G cell towers. I am also unable to be in a WiFi field, or near a cordless telephone base unit. This means that I can hardly go anywhere, including theaters, coffee shops, hospitals, municipal buildings, etc. I cannot travel because I cannot stay in any hotels. I can no longer work as a librarian. When I am exposed to these currently-legal levels of radiation I get a headache, nausea, and dizziness, and I feel weak and sick all over. I cannot sleep in these fields. I have moved out of the city of Santa Fe, and feel the radiation intensely when I go into town. I know many people who are being similarly injured."

Exhibit C

Before the Federal Communications Commission
Washington, D.C. 20554

In the Matter of:

COMMENT SOUGHT ON STREAMLINING	**)**	
DEPLOYMENT OF SMALL CELL INFRASTRUCTURE	**)**	**WT Docket No. 16-421**
BY IMPROVING WIRELESS FACILITIES SITING POLICIES;	**)**	
MOBILITIE, LLC PETITION FOR DECLARATORY RULING	**)**	

To: Office of the Secretary
Federal Communications Commission
Washington, DC 20554

Comment Filed by: Catherine Kleiber
N9387 Riverview Dr.
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(920) 478-9696

February 3, 2017

Dear FCC Commissioners,

Please do not further preempt local authority over zoning and lease negotiation. 5G is an unsustainable and dangerous technology. It will do great harm to human health and the environment.

Contrary to industry representations, **wireless technology is neither a sustainable nor environmentally-friendly technology** because wireless connectivity uses far more energy than wired connectivity. According to *Energy Consumption in Wired and Wireless Access Networks,* "**Wireless technologies will continue to consume at least 10 times more power than wired technologies** when providing comparable access rates and traffic volumes. PON [passive optical networks] will continue to be the most energy-efficient access technology." (http://people.eng.unimelb.edu.au/rtucker/publications/files/energy-wired-wireless.pdf). A paper looking at the energy consumption of cloud computing states, "**Our energy calculations show that by 2015, wireless cloud will consume up to 43 TWh**, compared to only 9.2 TWh in 2012, an increase of 460%. This is an increase in carbon footprint from 6 megatonnes of CO2 in 2012 to up to 30 megatonnes of CO2 in 2015, **the equivalent of adding 4.9 million cars to the roads**. Up to **90% of this consumption is attributable to wireless access network technologies**, data centres account for only 9%." (http://www.ceet.unimelb.edu.au/publications/ceet-white-paper-wireless-cloud.pdf) It is clear from the discussion that cloud computing does not save energy unless it displaces local computing power, otherwise it just increases energy consumption, especially when accessed wirelessly. The FCC ought to be focusing on providing quality wired broadband nationwide to protect health and the environment and promote sustainability.

There has been no NEPA review of the environmental and human health impacts of moving forward with 5G. The FCC has put the cart before the horse in seeking to preempt local zoning authority to promote 5G without first studying the safety of 5G for humans and the environment. There is consensus within the scientific community that the existing FCC limits for wireless radiation do not protect the population from biological effects (www.EMFscientist.org)

At least three federal agencies have indicated that the FCC radiofrequency (RF) radiation limits with which wireless technology must comply are not protective of either human health or the environment during the chronic non-thermal exposures ubiquitously present today.

The U.S. National Toxicology Program recently released results showing that radiofrequency radiation (RFR) can indeed both break DNA and cause cancer. A replicated European study has found that RFR is also a cancer promoter (http://ehtrust.org/science/facts-national-toxicology-program-cellphone-rat-cancer-study/). Furthermore, the literature on RFR in the very high frequency bands required for 5G document DNA breakages, serious cellular resonance effects, and other detrimental metabolic effects (http://www.bioinitiative.org/report/wp-content/uploads/pdfs/sec15_2012_Evidence_Disruption_Modulation.pdf and http://www.stopglobalwifi/documents/2001_kositsky_et_al._-_ussr_review.pdf).

The U.S. Department of Interior (DOI) stated, "*the electromagnetic radiation standards used by the Federal Communications Commission (FCC) continue to be based on thermal heating, a criterion now nearly 30 years out of date and inapplicable today,*" in reference to the current limits governing radiation utilized by wireless technology. The DOI letter discusses a number of studies showing that birds are harmed by low-level RF radiation associated with cell towers and other wireless technologies (http://www.ntia.doc.gov/files/ntia/us_doi_comments.pdf). **Furthermore, DOI required FirstNet to undergo a comprehensive NEPA review and planning program. Therefore, 5G, which will have similar widespread impacts, requires a NEPA review as well.**

The U.S. Environmental Protection Agency has stated, "The FCC's current exposure guidelines, as well as those of the Institute of Electrical and Electronics Engineers (IEEE) and the International Commission on Non-ionizing Radiation Protection, **are thermally based, and do not apply to chronic, nonthermal exposure**

situations. They are believed to protect against injury that may be caused by acute exposures that result in tissue heating or electric shock and burn. The hazard level (for frequencies generally at or greater than 3 MHz) is based on a specific absorption dose-rate, SAR, associated with an effect that results from an increase in body temperature. The FCC's exposure guideline **is considered protective of effects arising from a thermal mechanism but not from all possible mechanisms.** Therefore, the generalization by many that the guidelines protect human beings from harm by any or all mechanisms is not justified." (emphasis added) (http://www.emrpolicy.org/litigation/case_law/docs/noi_epa_response.pdf)

Non-industry funded studies have consistently found links between RF radiation and various negative biological effects (www.bioinitiative.org). They include serious neurological, cardiac, and metabolic effects, as well as DNA breakage which can lead to cancer and genetic defects (http://www.mainecoalitiontostopsmartmeters.org/?p=1469).

Studies, including the National Toxicology Program studies, have shown wireless to be a dangerous technology and 5G, according to Chairman Wheeler's own comments, is an infrastructure intensive technology. So, invest in safe, wired infrastructure instead of spending a lot of money to saturate entire communities with hazardous radiation. The "cool" factor is not worth the peril.

It is time for the FCC to act in a precautionary way and stop promoting wireless, especially 5G. WiFi is already causing radiofrequency sickness in children and adults. The data suggests 5G is likely to be even more dangerous. No one should be forced to be exposed to a carcinogen when connectivity can be achieved in safer ways. The FCC should be completing the process of establishing meaningful biologically-based population protective RF safety limits instead of forcing people to be exposed to more RF radiation.

There are effects far beyond cancer. My family has had the misfortune to experience them firsthand. It has been a nightmare. Not only is the FCC abdicating its responsibilities by not establishing meaningful biologically protective RF safety limits before promoting further RF exposures, it is violating human rights. Please read "Wireless Technology Violates Human Rights," attached and at http://www.electricalpollution.com/documents/WirelessViolatesHumanRights2016.pdf. If you continue to expedite 5G, which will increase exposure to a carcinogen and pollutant with potent harmful biological activity, you will also be violating human rights and the Nuremberg Code of Ethics.

Recent scientific publications look specifically at causality, such as M.L. Pall in "*Microwave Frequency Electromagnetic Fields (EMFs) Produce Widespread Neuropsychiatric Effects Including Depression*" (J Chem Neuroanat. 2015 Aug 20; http://www.sciencedirect.com/science/article/pii/S0891061815000599). It discusses the causal relationship between exposure to radiation from wireless technology and neuropsychiatric effects. Mechanisms of action are also discussed. It is likely the rampant proliferation of wireless radiation (to which 5G would add greatly) is an important factor behind the marked increase in mass killings due to the detrimental psychiatric effects it can have. Many of the perpetrators were technology addicts and thus highly exposed to RF radiation. Prudence and caution would dictate a halt to the proliferation of wireless technology.

A recent study by Yakymenko, et al., 2015, *Oxidative Mechanisms of Biological Activity of Low-intensity Radiofrequency Radiation* finds in 93 of 100 reviewed studies a wide pathogenic potential of the induced Reactive Oxygen Species (ROS) and their involvement in cell signaling pathways which explains a range of biological/health effects of low intensity RF radiation, including both cancer and non-cancer pathologies. Their concluding analysis demonstrates low-intensity RF radiation is an impressive oxidative agent for living cells with a high pathogenic potential and that the oxidative stress induced by RF radiation exposure should be recognized as one of the primary mechanisms of the biological activity of this kind of radiation (http://www.mainecoalitiontostopsmartmeters.org/wp-content/uploads/2015/07/Yakymenko-et-al-2015.pdf).

Not only is the radiation utilized by wireless technology dangerous to people, it is dangerous to the environment. Therefore, the need for a NEPA review is triggered.

FCC must complete a NEPA review and EIS prior to implementing 5G
The potential environmental and human health hazards from 5G necessitates a comprehensive NEPA review [*Envtl. Def. Fund v. Tenn. Valley Auth.*, 468 F.2d 1164, 1174 (6th Cir. 1972)] and, specifically, a formal Environmental Impact Statement (EIS). The EIS should include a full review of environmental effects, as well as human health and safety. The FCC has an obligation to evaluate whether "*services or capabilities are essential to public health, safety, or in the public interest*" (H.R. Report No. 104-204, p. 94) and so must protect the public from possible harm caused by radiofrequency radiation.

The FCC is not entitled to essentially disregard comments that do not provide global cost-benefit analysis (*Scenic Hudson v. Federal Power Commission)*. The Commission has an affirmative duty to inquire into and consider all relevant facts. The FCC must use government resources to perform the relevant analysis. The FCC should request the EPA use its National Risk Management Research Laboratory resources and experts to conduct all cost analyses necessary.

This proposal also triggers the need for a Memoranda of Understanding (MOU) with U.S. Fish and Wildlife Service under Executive Order 13186 concerning effects on migratory birds.

RF radiation kills and damages trees
Trees are being killed and damaged across the U.S. and world-wide even without full-scale implementation of 5G. RF radiation is being implicated as the cause. Several studies show the very serious effects that RF radiation has on the health of trees. Trees are essential to the welfare of the global environment and the continuation of the human race. Decimation of the Amazon rainforest by direct human actions has been oft-cited as endangering the global environment. The FCC should not be moving forward with implementing a technology, 5G wireless technology, that will hasten the RF-caused death of our urban and rural forests. Please read the following papers to see the toll RF is already taking on trees. We cannot afford additional forest die-off. Large mature trees are being seriously damaged and killed. This damage will take 50 years or more to repair.

- Radiofrequency radiation injures trees around mobile phone base stations https://www.researchgate.net/publication/306435017_Radiofrequency_radiation_injures_trees_around_mobile_phone_base_stations

- Adverse Influence of Radio Frequency Background on Trembling Aspen Seedlings: Preliminary Observations https://www.hindawi.com/journals/ijfr/2010/836278/

- Tree damage in the vicinity of mobile phone base stations http://kompetenzinitiative.net/KIT/wp-content/uploads/2016/06/Tree-damages-in-the-vicinity-of-mobile-phone-base-stations.pdf

- The trees make it easy to recognize the effects of RF-EMF. Examples of tree damage: http://kompetenzinitiative.net/KIT/wp-content/uploads/2016/09/Trees-in-Bamberg-and-Hallstadt-Documentation-2006-2016.pdf

- Electromagnetic Fields Act Similarly in Plants as in Animals: Probably Activation of Calcium Channels via Their Voltage Sensor: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3780531/

The damage to trees is not theoretical. We are seeing it on our farm now. We have seen it in the city for years, but now we are seeing it in the country as well, on a widespread basis.

July 24, 2016
Note thinness in tree on right and bare spot

August 9, 2016
Damage progressing

September 12, 2016
More leaves lost. No sign of healthy
fall leaf color so fall is not the cause.

October 10, 2016
Still no fall color, but leaf loss nearly complete in righthand tree.

July 24, 2016
These cottonwoods trees began exhibiting damage similar to the trees above in 2015. Most of them greened up in the spring 2016, then had the leaves die and drop. Two still retain leaves low down. Others are completely dead.

As you can see the damage to trees is progressing quickly to death. Balimori discusses the fact that "*White and black poplars (Populus sp.) and willows (Salix sp.) are more sensitive. There may be a special sensitivity of this family exists or it could be due to their ecological characteristics forcing them to live near water, and thus electric conductivity.*" Certainly the trees that are worst off in our area are willows and cottonwoods and they are growing in areas that are wet, but I have seen trees of all types exhibiting damage. Please think of the future. We cannot live without a healthy tree population. We rely on them for the very oxygen we breathe. **No technology is worth endangering something as essential as our source of oxygen.**

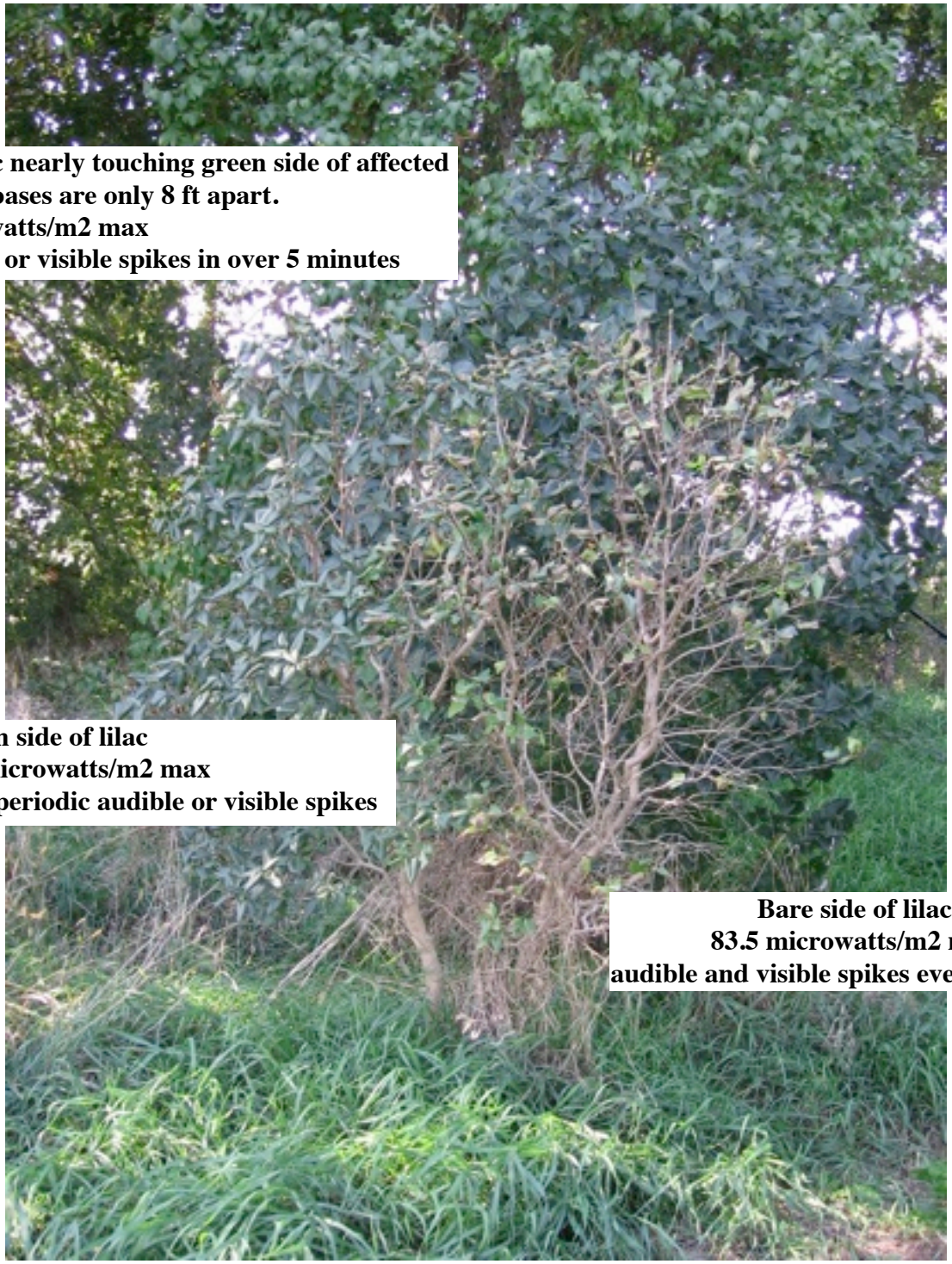
Please halt the rollout of 5G and deny the request to preempt local zoning authority.

September 18, 2016
Notice uneven leaf drop, unhealthy green, and absence of fall color. Characteristic of RF damage

Close-up of leaves from one of the cottonwoods above. Notice necrotic lesions and off color characteristic of RF leaf damage. No normal fall color present, despite on-going leaf drop.

Note the small damaged leaves across the top of the maple below. Trees of all different species around our yard are demonstrating this damage. Also mentioned in the aforementioned papers. We have no transmitters so all RF from outside sources.

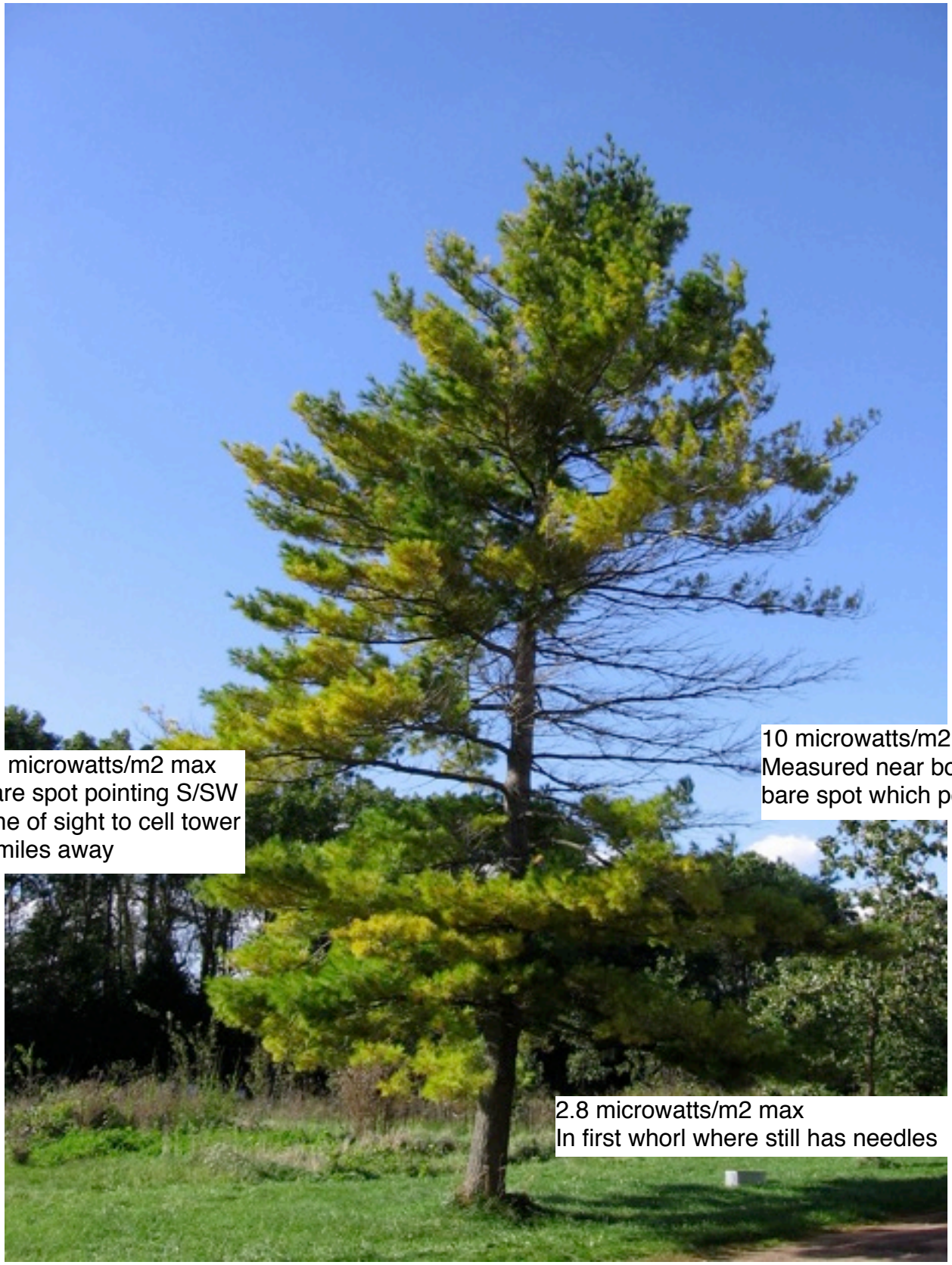
Lilac showing marked one sided damage. Signal appears to be coming from a WiFi tower on a hill about a mile away.



Green lilac nearly touching green side of affected lilac. The bases are only 8 ft apart.
0.6 microwatts/m2 max
no audible or visible spikes in over 5 minutes

Green side of lilac
2.8 microwatts/m2 max
only periodic audible or visible spikes

Bare side of lilac
83.5 microwatts/m2 max
audible and visible spikes every 9 seconds


39 microwatts/m2 max
Bare spot pointing S/SW
Line of sight to cell tower
6 miles away
10 microwatts/m2 max
Measured near bottom of
bare spot which points N
2.8 microwatts/m2 max
In first whorl where still has needles

Please read the following reports which demonstrate that wireless technology is causing serious harm to wildlife:

- "The Report on Possible Impacts of Communication Towers on Wildlife Including Birds and Bees" commissioned on 30th August 2010 by the Ministry of Environment and Forest, Government of India http://www.moef.nic.in/downloads/public-information/final_mobile_towers_report.pdf

- "Impacts of radio-frequency electromagnetic field (RF-EMF) from cell phone towers and wireless devices on biosystem and ecosystem – a review" http://www.biolmedonline.com/Articles/Vol4_4_2012/Vol4_4_202-216_BM-8.pdf

- Balmori, A. "Electromagnetic pollution from phone masts. Effects on wildlife," Pathophysiology (2009), doi:10.1016/j.pathophys.2009.01.007 http://www.ncbi.nlm.nih.gov/pubmed/19264463

The Supreme Court of India ordered cell towers removed from schools, colleges, hospitals and playgrounds in Rajasthan because of radiation being "hazardous to life." The court's amazing 200+ page decision thoroughly reviews the worldwide evidence that cell towers are harming human beings and wildlife (http://timesofindia.indiatimes.com/city/jaipur/No-mobile-towers-near-schools-hospitals-directs-Rajasthan-HC/articleshow/17399705.cms).

On July 5, 2013 the Supreme Court of India upheld this decision.

Other countries around the world are also taking precautionary action to prevent further harm due to the strength of the evidence that radiation from wireless technology is harmful. Please watch this video clip (https://www.youtube.com/watch?v=yYDmIq-nTn4) to see how far radiation from wireless technology penetrates into the body. Please note that children are at a far higher risk. Children are our future. A technology that endangers them endangers our future and should not be promoted. Numerous foreign countries have taken precautionary action to protect their children (http://ehtrust.org/policy/international-policy-actions-on-wireless/). Our children deserve no less. The telecommunication industry is in a hurry to roll out their technology before the public fully realizes how dangerous it is. The FCC is supposed to be protecting the health of all Americans and should not be complicit in forcing exposure to a dangerous technology.

Steps for minimizing exposure to RF can be found at www.electricalpollution.com on the Solutions page. They could be used to make the United Stated one of the healthiest nations on the planet.

Don't unleash a dangerous environmental pollutant on your friends, family, and, indeed, the whole country. Protect your family, friends, and the country - halt implementation of 5G and deny the request to preempt local zoning to expedite 5G. Help bring wired broadband to everyone by placing a tariff on the use of wireless and use the proceeds to fund dedicated wired broadband internet. Be on the right side of history.

Sincerely,

Catherine Kleiber

Exhibit D

FCC 13-39

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Reassessment of Federal Communications	)	ET Docket No. 13-84
Commission Radiofrequency Exposure Limits and	)	
Policies	)	
	)	
Proposed Changes in the Commission's Rules	)	ET Docket No. 03-137
Regarding Human Exposure to Radiofrequency	)	
Electromagnetic Fields	)	
	)	

To: Office of the Secretary
Federal Communications Commission
Washington, DC 20554

Comment Filed by: Catherine Kleiber
N9387 Riverview Dr.
Waterloo, WI 53594
kleiber@gdinet.com
(920) 478-9696

August 30, 2013

AFFIDAVIT OF CATHERINE KLEIBER

State of Wisconsin]
] ss.
County of Jefferson]

CATHERINE KLEIBER being duly sworn deposes and says:

1. My name is Catherine Kleiber. I live in the country at N9387 Riverview Drive, Waterloo, Wisconsin.

2. My husband and I have lived on our farm in Waterloo, Wisconsin since 1996.

3. The existing FCC radiofrequency radiation limits are too high to protect human health. The limits need to be lowered immediately. New safety limits should be enacted using a biologically-based model.

4. I categorically disagree with the FCC's statement in paragraphs 8 and 9 and footnote 10 that a NEPA evaluation is unnecessary and premature. The FCC fails to consider that there are actually two options needing evaluation - the considerable environmental and human health costs of doing nothing and the environmental and human health benefits of basing safety limits on biology, along with the monetary costs of both. This is a situation that calls for NEPA review, *Envtl. Def. Fund v. Tenn. Valley Auth.*, 468 F.2d 1164, 1174 (6th Cir. 1972), specifically a formal Environmental Impact Statement (EIS) . My experience alone, outlined below, provides the evidence of injury under existing inadequate radiofrequency (RF) limits, causality, along with the potential for remedy with the enactment of meaningful biologically-based RF safety limits that, indeed, necessitates a full NEPA evaluation of the options - keeping RF limits at thermal levels or setting meaningful biologically-based RF safety limits.

5. The NEPA evaluation and EIS are necessitated by the presence of two options which have the potential to have radically different impacts *Burkholder v. Peters*, 58 F. App'x 94, 96 (6th Cir. 2003) (quoting42 U.S.C. § 4332(2)(C)). The EIS should include a review of the impact of both options on the environment, as well as on human health and safety. "The Report on Possible Impacts of Communication Towers on Wildlife Including Birds and Bees" commissioned on 30th August, 2010 by the Ministry of Environment and Forest, Government of India (incorporated by reference herein in its entirety http://www.moef.nic.in/downloads/public-information/final_mobile_towers_report.pdf) and "Impacts of radio-frequency electromagnetic field (RF-EMF) from cell phone towers and wireless devices on biosystem and ecosystem – a review," (incorporated by reference herein in its entirety http://www.biolmedonline.com/Articles/Vol4_4_2012/Vol4_4_202-216_BM-8.pdf) both provide enough compelling evidence of potential environmental harm at existing RF

limits to necessitate an EIS evaluating existing limits compared to biologically-based RF safety limits.

6. On September 1, 2012, in response to the evidence contained in the "Report on Possible Impacts of Communication Towers on Wildlife Including Birds and Bees," India dropped its maximum transmission limits to one tenth of its previous limits, already lower than U.S. permissible limits, and placed a moratorium on installation of antennas within 1 km of each other. India continues work on a more final rule. This shows that the substance of the report is indeed compelling.

7. The FCC has a duty to the public to protect the public health and safety from harm from radiofrequency radiation (H.R. Report No. 104-204, p. 94).

8. In May 2011, IARC classified radiofrequency radiation, including radiation from all wireless technologies, as a class 2B possible carcinogen.

9. In the 2012 BioInitiative Report, the authors conclude radiofrequency radiation is a carcinogen. One mechanism responsible for the carcinogenic effect of radiofrequency radiation is its ability to initiate the Fenton Reaction, just as ionizing radiation does. The 2012 BioInitiative Report is incorporated by reference herein in its entirety (http://www.bioinitiative.org/)

10. The FCC radiofrequency radiation limits are outdated and obsolete. They are based on physics, not biology and, therefore, the limits are so high that they are useless for protecting the population from harmful biological effects. *"Public safety standards are 1,000 – 10,000 or more times higher than levels now commonly reported in mobile phone base station studies to cause bioeffects."*(http://www.bioinitiative.org/conclusions/)

11. Since the FCC lacks the expertise to establish meaningful biologically-based safety limits, it is the duty of the FCC to advocate for allocating funding and authority to the EPA to establish biologically-based safety limits. 2012 HR6358 exists as a model of legislation to do just that.

12. The FCC is not entitled to essentially disregard comments from citizens because they cannot provide global cost-benefit analysis (*Scenic Hudson v. Federal Power Commission)*, as is suggested by paragraphs 109 and 209. The Commission has an affirmative duty to inquire into and consider all relevant facts. They must use government resources to perform the relevant analysis. The FCC should request that the EPA use its taxpayer-funded resources and experts present at its National Risk Management Research Laboratory to conduct all of the cost analyses the FCC has asked for in this proceeding.

13. In paragraphs 66, 67, and 68, I provide information about the monetary costs incurred by me and my family as a direct result of the FCC's negligence in not putting into place biologically-based RF safety limits years ago. The emotional and social costs

have also been very steep. None of the common uses of wireless technology comes close to justifying the monetary, physical, emotional, and social price our family has been forced to pay for it.

14. My family's on-going health nightmare, caused by the presence of biologically active levels of radiofrequencies on the electrical grid and radiofrequency radiation transmitted into the environment through use of wireless technology, is illustrative of why it is essential that the EPA finally be empowered to establish biologically-based radiofrequency radiation safety limits.

15. I have radiowave sickness. (See Dodge, incorporated by reference herein in its entirety http://www.magdahavas.com/wordpress/wp-content/uploads/2010/08/Dodge_1969.pdf) It was originally misdiagnosed as chronic fatigue syndrome. However, once I found out I was being exposed to large amounts of high frequencies from electrical pollution, including "dirty" power on my wires and plumbing, and reduced that exposure as much as I was able, I began to recover almost immediately.

16. Here is a brief summary of symptoms I experienced during my high frequency related illness: heart palpitations, very pain sensitive, constant nerve pain, sluggish reactions, poor depth perception, muscle weakness, lactic acid buildup with little exertion, unrefreshing sleep, often wakeful in the night, fatigue, night sweats, poor circulation to my extremities, reflux, difficulty concentrating, difficulty thinking, inability to make decisions, low-grade fever and chills, headaches, and a dry sore throat.

17. We have reduced our exposure as much as possible. I was well at home until smart meters on our neighbors' homes, power line communications frequencies, and 4G cell service increased our exposure enough that I began once again to experience symptoms even while in our home. We have taken additional steps to reduce our exposure to the pulse modulated microwave radiation used in wireless technology and high frequency power line communication signals.

18. I get sick again whenever I am around higher levels of high frequencies such as when I go into town. The degree of sickness and the exact symptoms vary depending on the duration and strength of the exposure, as well as the particular frequencies to which I am exposed.

19. The ambient levels of pulsed microwave radiation are now so high that I can no longer even try to go to friends' and relatives' homes, restaurants, movies, public events, or "shopping" - in the event I have to go into a store I try to arrange ahead for the item I need to be ready for me or I go in quickly, ask for assistance finding the item, buy it and leave.

20. I have had serious radiation sickness reactions to these polluted environments including cardiac arrhythmias, cognitive difficulties, short and long-term memory problems, severe neurological pain, hair loss and serious gastrointestinal effects if I try to stay longer. (See "Provocation study using heart rate variability shows

microwave radiation from 2.4 GHz cordless phone affects autonomic nervous system," incorporated by reference herein in its entirety http://electromagnetichealth.org/wp-content/uploads/2010/10/Havas_HRV_Ramazzini1.pdf)

21. One meeting, where cellphones and wifi were present, followed by what should have been a quick trip to an office supply store, which had gotten a wireless telephone headset system since my last visit, caused serious radiation poisoning symptoms. I had cardiac arrhythmias from the radiofrequency radiation at both locations. Nerve pain began toward the end of the meeting and grew worse at the store and was so bad by the time I got home that I had to limit how my children could touch me for a couple of days. Serious gastrointestinal pain and dysfunction resulting in massive diarrhea began very shortly after arriving home and finally began to subside 3 days later. The pain and diarrhea were so severe with food that I had to quit eating for a couple of days while my intestine healed. The symptoms began at the meeting and quickly escalated while I waited nearly twenty minutes for service at the store and persisted for over 3 days. The association between the exposure and the symptoms was very clear. I consumed no food at the meeting or at the store. I had no symptoms of a bacterial/viral infection.

22. We have two small children whom we are homeschooling so they will not be exposed to dangerous high frequency environment in our local public school (Waterloo, WI). The school has both WiFi and high electrical pollution levels.

23. Our children both experience health problems when exposed to high frequencies. They feel sick, become hyperactive, less able to think logically and control their behavior. They also sleep poorly in bad high frequency environments. The recent increase in radiofrequency radiation exposure has given them chronic cardiac arrhythmias which worsen markedly when they are exposed to the higher levels of pulsed microwave radiation common in society within the last couple of years. (Video demonstrates finding of cardiac arrhythmia caused by DECT phones - http://www.youtube.com/watch?v=p-mw_nCJWs4&list=UUxs1UgZ6DivWUfG1dX3TELw&index=10)

24. The drastic measures we have taken to reduce their exposure has momentarily stabilized them at about early stage 2 radiofrequency sickness. (See Dodge) We are very concerned that any increase in the radiofrequency radiation levels could again push them over the edge toward stage 3 radiofrequency sickness. They should not be involuntarily exposed to a pollutant that has such profound detrimental effects on them.

25. I have maintained the website www.electricalpollution.com since 2002, shortly after I discovered that the high frequencies present on building wiring and flowing across the ground from non-linear time varying loads were making me, and others, sick. Research on the health effects of electrical pollution is available on the website on the Research Page. More technical information is available on the Technical Page.

Electrical pollution is a very potent form of exposure to high frequencies. Exposure to all forms of high frequencies, including electrical pollution, must be included in standards regulating exposure of the general public to protect the public health during continuous exposure.

26. Because of the serious effects exposure to high frequencies has on our health, we do not own a cellphone, cordless phones, wireless router, baby monitors, or subscribe to wireless internet.

27. I have read widely on the research into the health effects of exposure to high frequencies. I believe that the increased exposure to high frequencies from radiowave and microwave transmitters and from electrical pollution are behind the public health crisis that has dramatically increased utilization of our medical system for chronic conditions. The article by Halberg and Johansson in *Pathophysiology*[1] supports this contention. The comprehensive review by Dr. Cherry, which documents health effects and explores mechanisms, besides thermal mechanisms, through which microwave and radiowave radiation can impact health, also supports my contention that exposure to microwave and radiowave radiation is a public health threat which is probably contributing to significant public illness. A review of the Soviet literature on radiofrequency sickness by Christopher Dodge[3] of the Naval Observatory discusses radiofrequency sickness in detail. The symptoms attributed to chronic exposure to radiofrequency radiation mirror the deterioration of health being seen in the U.S. in recent years, probably due to the dramatic increase in exposure to radiofrequencies from electrical pollution and wireless technology. Papers by Dr. Milham[4], Dr. Havas[5,6,7] and Dr. Wertheimer[8] also show that exposure to electrical pollution constitutes a public health threat, as does a report by Char Sbraggia regarding health improvements experienced by teachers and students when the electrical pollution in their school was cleaned up (MelMinNurse.pdf). These are just a few of the papers I have read. However, they provide a picture which should illustrate the need for precautionary action to halt the expansion of public exposure to high frequencies until safety standards can be established to prevent health problems in the general population during continuous exposures to high frequencies, taking into account all sources of exposure.

1. Ö. Hallberg, O. Johansson, Apparent decreases in Swedish public health indicators after1997 —Are they due to improved diagnostics or to environmental factors? Pathophysiology (2009)
2. Cherry, N. 2000 Criticism of the Health Assessment in the ICNIRP Guidelines for Radiofrequency and Microwave Radiation (100 kHz- 300 GHz)
3. Dodge C. Clinical and Hygienic Aspects of Exposure to Electromagnetic Fields. Biological Effects and Health Implications of Microwave Radiation, Symposium Proceedings, Richmond, Virginia, September 17-19, 1969.
4. Milham S, Morgan L. 2008 A New Electromagnetic Exposure Metric: High Frequency Voltage Transients Associated With Increased Cancer Incidence in Teachers in a California School. American Journal of Industrial Medicine.
5. Havas M, Olstad A. 2008. Power quality affects teacher wellbeing and student behavior in three Minnesota Schools, Science of the Total Environment, July.

6. Havas M. 2006. Electromagnetic hypersensitivity: biological effects of dirty electricity with emphasis on diabetes and multiple sclerosis. Electromagnetic Biology Medicine 25(4): 259-68.
7. Havas M. 2008. Dirty Electricity Elevates Blood Sugar Among Electrically Sensitive Diabetics and May Explain Brittle Diabetes. Electromagnetic Biology and Medicine, 27:135-146.
8. Wertheimer N, Savitz DA, Leeper E. 1995 Childhood Cancer in Relation to Indicators of Magnetic Fields from Ground Current Sources Bioelectromagnetics 16: 86-96.

28. I knew that an increase in levels of transmitted radiofrequency and microwave radiation would be very detrimental to my health and that of my family and would further impair our ability to live a normal life.

29. Therefore, we refused installation of the We Energies AMR meters, which transmits a spike of microwave radiation (approximately 1800 $\mu W/m^2$) every 6 seconds 24 hours a day, 7 days a week, on our two electrical services.

30. I asked for reasonable accommodation under the ADA because I knew that my children and I experience environmentally induced functional impairment with exposure to radiofrequency radiation, including the pulsed modulated microwave radiation utilized by the We Energies AMR meters.

31. My initial request was denied verbally by the PSC and in writing by We Energies.

32. We had to turn away at least one installer who came to install meters after we were on the record with We Energies and the PSC as not wanting an AMR meter installed.

33. We were concerned that we would find AMR meters installed despite our clearly expressed refusal to have AMR meters, so we padlocked our meter pedestals and installed clearly worded permanent signage.

34. In response to our continued refusal to allow installation of the meter, we were threatened with disconnection. (See WeEnergies9Dec2011.pdf)

35. My mother and father-in-law tried to refuse to take a transmitting meter so we would still be able to visit and were bullied into taking the meters by a disconnect threat. We can no longer visit. Our one try was cut short by our younger son feeling so ill that he was crying and begging to leave - in spite of it being Christmas with relatives, presents, and candy.

36. Both We Energies and the PSC maintained, over the phone and at the meeting with the legislators, that we had three choices and represented them as accommodation.
    1. Take the AMR meters.
    2. Take the AMR meters and move them anywhere on our property at our considerable expense (thousands of dollars to move them even short distances).

3. Get off-grid.

37. We do not consider these choices to have been any form of accommodation since we could not have moved the meters far enough to protect our health. Also, the radiofrequencies the meters produce get on the wires, essentially turning the house into a low-power microwave. This proved to be a problem even though our nearest neighbor is over half a mile away. Having two meters of our own would have worsened the effect.

38. We consider the refusal to accommodate us and the threat to disconnect us to have been bullying and intimidation on the part of We Energies and the Wisconsin Public Service Commission.

39. A group of us met with state legislators (Sen. Grothman, Rep. Jorgensen, and Connie Schulze, a staff-member of Sen. Darling's, who were supportive, but unwilling to sponsor legislation to help us.

40. I called numerous federal agencies - to no avail.

41. In March 2011, we received a letter from We Energies threatening to disconnect us within 48 hours for denying them access to the meter pedestal, which we own. This, in spite of the fact that, during a conversation about the supposed safety issue and the fact that We Energies can easily disconnect power to our farm at our transformer in case of an emergency, Tom Held (Supervising Engineer Meter Technology) concurred saying "I know. They can pull the fuse."

42. We had been customers in good standing.

43. Again we appealed to the PSC for accommodation under the ADA (PSCMarch2011WEcutoff.pdf) and asked that they address the radiation coming off of our transformer and causing cardiac arrhythmia for our son, only to be told that they would stand by and watch us disconnected, although they would make We Energies wait until after April 15. They did not address the dangerous radiation at all.

44. After consulting multiple lawyers, realizing that the sole power to provide or deny accommodation resided with the PSC, and even being told outright by one lawyer that our best bet was to get off the grid, we began making preparations -at considerable expense- in case we were forced off-grid, fighting all the while.

45. We got a propane refrigerator, a pilot light gas stove, installed a gravity flow hot water heating system, acquired a generator to run our commercial freezer and installed a solar photovoltaic system to run a new DC well pump and sump pumps and converted our computer to run on DC.

46. We felt that the PSC was in violation of its own statutes in standing by and watching customers in good standing get disconnected and that We Energies was in violation of

the law, but with no one to defend us, we had no recourse other than the one easily accessible public forum - a Letter to the Editor. (We had contacted various legal organizations including the ACLU, Public Citizen, Common Cause, and NRDC. All said that they have limited funding and they had never heard of this before. News outlets were similarly uninterested - utilities and telecom companies provide substantial funding through advertising or outright ownership.) We did also reply to the PSC.

47. The PSC once again refused to exercise their right to stop We Energies from disconnecting us for refusing the transmitting meter.

48. The PSC refused to accommodate us in large part because the AMR meters were supposedly in compliance with FCC radiofrequency limits (see PSC27Apr2011reDATCP.pdf), in spite of the fact that FCC limits were never intended to protect anyone from the biological effects we experience. Compliance with FCC limits has been used to force many many people from across the country to have devices which compromise their health.

49. After we wrote the letter to the editor, Sue Crane, Manager Special Projects at We Energies contacted us and asked that we remove the padlock stating that she would personally guarantee in writing that the meters would not be changed for 6 months.

50. On October 8, 2011, we sent letters to the PSC and We Energies requesting that they remove our electrical service since they had repeatedly ignored our requests to address the problems on their system that were causing large amounts of very high frequency radiation to radiate off of our transformer and our house wiring.

51. We had been forced to sleep in a tent a half mile from our home site (and at least that from other electrical services) from the end of July through October 13, 2011 - the start of early deer hunting season - in order to stabilize our sons' cardiac health. (From the start of deer hunting until the secondary wires were removed on October 19, 2011 we slept in the bed of our full-sized truck parked in our metal machine shed with the openings facing the transformer electrically shielded and the bed opening away from the transformer. The electrical service to the shed was already disconnected thus preventing it from conducting the radiofrequencies in.)

52. Both sons were affected, although our younger son was affected more severely. After initial tachycardia incidents which we became aware of in the fall of 2010, they moved on to irregular heartbeat and heart rate which finally got quite slow and irregular, particularly during sleep. Additionally, Holter monitoring found that both boys had sinus arrhythmia. This is consistent with the descriptions of stages one and two of radiofrequency sickness in Dodge (attached). On a Holter monitor, our younger son only had a high of 242 bradycardia incidents hourly at the tent versus 1637 hourly at home. Our older son had a high of 165 bradycardia incidents hourly at home with no comparable due to a mistake on the part of the hospital. Our younger son's heart rate got so slow one night when we were forced by broken tent poles to

sleep at home that he lost bladder control, wetting only his underwear because the volume of urine was so small. When I went to him in response to his call, he was agitated and upset, but his heart rate was very slow and the beats were weak and irregular. This continued for a couple of hours. We did not sleep in the house again after that until after the secondary lines were removed.

53. The deterioration in our health began shortly after the smart meters were installed in our area. Strong power line communication signals (likely related to broadband over power lines) in the 12.4 to 13.2 MHz and 25.5 to 26.3 MHz range along with communication signals radiating from our end of the line transformer and our home wiring seem to have been the final straw.

54. Signals in the 1 MHz to 80 MHz range used for broadband over power lines and communication signals are not supposed to cross the transformer. However, what happens when the signal hits the end of the line has not been considered as far as I know. Our experience suggests that it radiates and does cross the transformer enough to radiate off of the wiring and plumbing throughout the house at biologically-harmful levels.

55. We are now off-grid to protect our family's health.

56. After going completely off-grid, I had three heavenly weeks. I slept well, felt well, and had lots of energy. Our pets' health improved. Most importantly, our sons' cardiac rhythms had almost completely normalized and I was not awakened in the night.

57. Then, in early January 2012, 4G cellphone service was installed in our area. Within a week, our sons' cardiac rhythms were again highly irregular. Our younger son was again waking us in the night crying, sweating profusely, and feeling unwell with a highly irregular cardiac rhythm. He was also clingy and fussy during the day.

58. My husband screened all the windows with aluminum screen to reduce his exposure. Again, he slept through the night and was less clingy, but their cardiac rhythms remained irregular.

59. We are currently essentially housebound, unable to spend significant time in houses or businesses which have transmitting meters, which includes almost every electrical service in our area.

60. Due to the detrimental health effects that we experience, we are unable to visit friends and relatives who have transmitting meters.

61. We cannot completely escape the constant exposure from neighbors transmitting utility meters, 4G cellphones, and the power line frequencies which still radiate from the junction box down the road that terminates the line.

62. As 2012 passed, we had to do more and more shielding to compensate for the ever increasing levels of radiation from wireless technology. We have had to restrict the amount of time our outdoors-loving sons can be outside. They are now only able to be out an hour a day. If they are out more than that with any regularity their cardiac arrhythmias become severe enough that they become clingy and we are awakened in the night.

63. I have not been able to do all the animal care, yard care, and gardening that I need to do in the course of the year. The garden is overgrown. I have not even been able to keep the few potatoes I planted weed-free. Obviously, I cannot fit duties that usually took me 6-8 hours daily into the one hour they can be outside without triggering more serious cardiac arrhythmias. I have trouble performing the physical labor I always have and must do to earn our living since my heart often does not beating efficiently, due to the radiofrequency radiation levels.

64. Radiofrequency radiation levels have climbed high enough that even being inside most of the time is not protective enough to keep our sons from being symptomatic. We have had to begin shielding further. Every little bit helps for awhile, then more people use their phones more, stream video more, etc and the levels increase further and we have to shield some more. How long before radiofrequency radiation levels climb high enough that being outside at all is dangerous? What happens when we have shielded the whole house and even so being inside does not offer enough protection? Who could take care of and protect my boys if anything happened to me and my husband?

65. I worry that I will run out of shielding options to protect my sons before meaningful biologically-based safety limits put an end to the insane increases in radiation exposure occurring rapidly now as usage of wireless technology increases. Radiofrequency sickness is serious and is life-threatening if it is not able to be properly treated by avoidance once it occurs.

66. The meters necessary to verify RF related problems cost over $1,500. Going off-grid, which was necessary to protect the lives of our sons, cost us over $70,000 dollars based on simple addition of the costs of all the separate parts and steps necessary to make that happen. The cost was that low because we were able to do much of the work ourselves. The solar installer estimated that the system we wished to put in at that time would cost us over $80,000 just for the solar system, not including the new heating system, refrigerator, well-pump, super-insulating the freezer, freezer generator, freezer/generator control switches, etc.

67. Shielding materials have cost us over $2,500 so far, also based on simple addition, and are likely to cost us at least $4,000 more just for the shielding materials, also based on simple addition. It has cost over $7,000 to get new windows for the low E coating which helps block RF, again far less than most people would pay because we can install them. I cannot stress enough that these are only the monetary costs and do not include the physical, emotional, and social price our family has been forced to pay

for the FCC's negligence in not implementing biologically-based safety limits. We are not wealthy and do not earn vast sums each year so it is a real question as to how long we can continue to pay for the continuous upgrades necessary to protect our family's health, yet how can we not? But, if we lose the farm doing it, what will happen to us?

68. FCC negligence in not establishing meaningful RF safety limits has caused us to pay more for my health insurance and therefore our sons' health insurance. The CFS diagnosis, which was really radiofrequency sickness from exposure to dirty power, caused me to become an automatic reject for health insurance. I was fortunate to be able to get health insurance through the Wisconsin Health Insurance Risk Sharing Plan (HIRSP), however even with the subsidy it was quite a bit more expensive than insurance I could have gotten as a healthy young woman. We had to have HIRSP policies for our sons as well, not due to their health which was great prior to the RF toxicity problems outlined above, but because you cannot insure children without at least one adult as primary on the policy. As an example of the great expense this caused us, the insurance quote we got in 2012, necessary to re-apply to HIRSP, for the whole family was $713.54/month. The premium for my insurance alone through HIRSP at that same time for the same $1.000 deductible was $729/month. HIRSP premiums at that same time and deductible level were $554/month for Dan and $387/month for each of the boys. Up until the 2008 flood and policy changes allowed us to qualify for health insurance assistance we were paying similar large monthly premiums. Thus, FCC negligence, resulting in the absence of biologically-based RF safety limits and my CFS diagnosis, forced our family to pay significantly more for health insurance than we would otherwise have had to.

69. It is important to stress our experience has been that people with radiofrequency sickness react to both RF exposures from wireless technology and "dirty" electricity.

70. The FCC is jeopardizing the health and lives of our children, and millions of others across the country, by not having meaningful biologically-based safety limits for radiofrequency radiation.

71. Not only is the absence of biologically-based RF safety limits in violation of common sense and the principles of public health protection, but the promotion of wireless technology, a technology that so severely restricts the activities of a portion of the population, violates the ADA, including the 2008 ADA amendments. The physical, social, and emotional costs of exclusion in spite of ADA protections and previous inclusion must be weighed in the EIS when it compares costs and benefits of the existing RF limits and enacting biologically-based RF safety limits.

72. We do not want to continue to be guinea pigs for the government-sanctioned rollout of new technologies with insufficient safety standards. We do not want to continue to be part of the experiment being involuntarily carried out on the American people verifying the results of decades old research showing that the long-term health effects of these wireless signals can be profound and dangerous. (See Dodge)

73. The levels of radiation our family experiences on a daily basis from transmitting utility meters, wireless broadband, cellphones, cell towers, and other sources, - WITHOUT OUR PERMISSION - is already causing serious daily health problems for us.

74. Without conservative safety standards designed to protect the public health of our entire population during continuous exposures from all detrimental health effects and the rigorous enforcement of such standards, we fear the long-term hazards to our family's health.

75. We have a right to be safe in our homes and our schools and workplaces, and we have a right to current safety standards based on current science, not mistaken assumptions (the thermal model) and wishful thinking.

76. The existing FCC radiofrequency radiation exposure limits are way too high. Severe biological effects occur at far lower levels, as demonstrated by my family's experience, as well as in studies. If the FCC persists in ignoring this fact and does not adopt biologically-based radiofrequency radiation safety limits, it will be directly responsible for the ill health, even death, of millions of people. (See the 2012 BioInitiative Report - http://www.bioinitiative.org/ - for mechanisms and diseases for which links have been made in recent scientific literature and Dodge - incorporated by reference herein in its entirety http://www.magdahavas.com/wordpress/wp-content/uploads/2010/08/Dodge_1969.pdf - for connections made over 40 years ago.)

77. I reaffirm that the information contained in the paragraphs above are true and correct.

78. End of affidavit.

Dated this 30 day of August 2013.

Catherine E Kleiber

Signature of Person Making This Affidavit

State of Wisconsin]
] ss.
County of Jefferson]

Subscribed and sworn to (or affirmed) before me this 30th day of August, 2013, by Catherine Kleiber of N9387 Riverview Dr., Waterloo, WI 53594, personally known to me or proved to me on the basis of satisfactory evidence to be the person who appeared before me.

Rebecca L Jones

Signature of Notary Public 4-17-14

Rebecca L. Jones

Notary Public Seal

Exhibit D

FCC 12-152

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Notice of Proposed Rulemaking	)	
18 FCC Rcd 13187, 13188 ¶1 (2003)	)	ET Docket No. 03-137
	)	
And	)	
	)	
Service Rules for the Advanced Wireless Services	)	WT Docket No. 12-357
H Block---Implementing Section 6401 of the	)	
Middle Class Tax Relief and Job Creation Act of	)	
2012 Related to the 1915-1920 MHz and	)	
1995-2000 MHz Bands ¶53 footnote 95	)	

To: Office of the Secretary
Federal Communications Commission
Washington, DC 20554

Reply Filed by: Daniel Kleiber
N9387 Riverview Dr.
Waterloo, WI 53594
kleiber@gdinet.com
(920) 478-9696

February 18 , 2013

AFFIDAVIT OF DANIEL KLEIBER

State of Wisconsin]
] ss.
County of Jefferson]

DANIEL KLEIBER being duly sworn deposes and says:

1. My name is Daniel Kleiber. I live in the country at N9387 Riverview Drive, Waterloo, Wisconsin.

2. My wife and I have lived on our farm in Waterloo, Wisconsin since 1996.

3. The current FCC radiofrequency radiation limits are too high to protect human health. The limits need to be lowered immediately. New safety limits should be enacted using a biologically-based model.

4. The FCC has a duty to the public to protect the public health and safety from harm from radiofrequency radiation (H.R. Report No. 104-204, p. 94).

5. In May 2011, IARC classified radiofrequency radiation including radiation from all wireless technologies, as a class 2B possible carcinogen.

6. In the 2012 BioInitiative Report, the authors conclude radiofrequency radiation is a carcinogen. One mechanism responsible for the carcinogenic effect of radiofrequency radiation is its ability to initiate the Fenton Reaction, just as ionizing radiation does. The 2012 BioInitiative Report is incorporated by reference herein in its entirety (http://www.bioinitiative.org/)

7. *"Public safety standards are 1,000 – 10,000 or more times higher than levels now commonly reported in mobile phone base station studies to cause bioeffects."*(http://www.bioinitiative.org/conclusions/)

8. The FCC radiofrequency radiation limits are outdated and obsolete. They are based on physics, not biology and, therefore, the limits are so high that they are useless for protecting the population from harmful biological effects. (http://www.bioinitiative.org/) Since the FCC lacks the expertise to establish meaningful biologically-based safety limits, it is the duty of the FCC to advocate for allocating funding and authority to the EPA to establish biologically-based safety limits. 2012 HR6358 exists as a model of legislation to do just that.

9. My family's on-going health nightmare, caused by the presence of biologically active levels of radiofrequencies on the electrical grid and radiofrequency radiation transmitted into the environment through use of wireless technology, is illustrative of why it is essential that the EPA finally be empowered to establish biologically-based radiofrequency radiation safety limits.

10. I am a type 1 diabetic and I use an insulin pump. My blood sugar is under good control, as long as I can avoid exposure to high frequencies.

11. I have had many instances where my blood sugar has increased dramatically in response to high frequency exposures and I have not been able to lower it with additional insulin until the high frequency exposure has stopped. One particularly memorable incident occurred when the neighbor, for whom I custom combine and who carries a cellphone that is turned on, joined me in the combine for about 3 hours. Prior to him entering the combine with his cellphone my blood sugar was 100-120. A short time later I tested and it was over 300. I took a bolus of insulin several times and my blood sugar did not respond. Minutes after he left the cab with his cellphone I tested and my blood sugar was dropping. It bottomed out near 30. I drank four cans of soda to get my blood sugar back to normal. This is far more than normally required and seemed to be because the insulin was finally able to act properly. Another incident occurred when we were visiting my wife's relatives in Canada. I again had high blood sugar that would not respond properly to insulin. We discovered that the neighbor's wireless router was responsible. I have also had similar reactions to high frequencies on electrical wiring, also known as "dirty" power or electrical pollution.

12. I have good reason to believe that greater exposure to radiofrequency radiation from the ever increasing use of wireless technology will endanger my health by making my blood sugar harder to control. Data cited in the review of Soviet literature related to the biological effects of exposure to radiofrequecy (rf) radiation suggest this is true. It mentions that in one study 75% of people working in rf fields were prediabetic. (See Dodge, incorporated by reference herein in its entirety http://www.magdahavas.com/wordpress/wp-content/uploads/2010/08/Dodge_1969.pdf)

13. I spend about 22 hours a week in the Madison, WI area vending at farmers markets during the spring, summer and fall. After market season ended and I finished custom combining, I was no longer around cellphone radiation on a daily basis. I had to decrease my basal insulin rate. Over about a month it dropped about 16%. Since then our rf environment has deteriorated and my basal insulin use has increased, although not yet to previous levels.

14. When I am exposed to high frequencies, I feel ill. If I have to run errands in town, I usually return home with a headache. I often find my blood sugar goes up in stores. I have been forced to leave meetings early because of feelings of nausea.

15. We have two small children whom we are homeschooling so they will not be exposed to the dangerous high frequency environment in our local public school (Waterloo, WI). The school has both WiFi and high electrical pollution levels.

16. Our children both experience health problems when exposed to high frequencies. They feel sick, become hyperactive, less able to think logically and control their behavior. They also sleep poorly in bad high frequency environments. The recent increase in radiofrequency radiation exposure has given them chronic cardiac arrhythmias.

17. The drastic measures we have taken to reduce their exposure has momentarily stabilized them at about early stage 2 radiofrequency sickness. (See Dodge) We are very concerned that any increase in the radiofrequency radiation levels could again push them over the edge toward stage 3 radiofrequency sickness. They should not be involuntarily exposed to a pollutant that has such profound detrimental effects on them.

18. Because of the serious effects exposure to high frequencies has on our health, we do not own a cellphone, cordless phones, wireless router, baby monitors, or subscribe to wireless internet.

19. My personal experience has shown me how serious the effects of exposure to high frequencies can be. Over the years I have only occasionally had time to read the research on high frequency exposure. I recently read the paper by Halberg and Johannsen in *Pathophysiology* [Ö. Hallberg, O. Johansson, Apparent decreases in Swedish public health indicators after1997—Are they due to improved diagnostics or to environmental factors? Pathophysiology(2009)]. I believe that paper alone should raise enough doubts to halt all additional spectrum rollouts, the smart meter rollout, expansion of wireless internet and expansion of other wireless communications until safety limits to protect the public health during continuous exposure to high frequencies from all sources including transmitted and electrical pollution are established. For more information about electrical pollution as a potent source of high frequency exposure please see www.electricalpollution.com.

20. I knew that an increase in levels of transmitted radiowave and microwave radiation would be very detrimental to my health and that of my family and would further impair our ability to live a normal life.

21. Therefore, we refused installation of the We Energies AMR meters, which transmits a spike of microwave radiation (approximately 1800 $\mu W/m^2$) every 6 seconds 24 hours a day, 7 days a week, on our two electrical services.

22. We had to turn away at least one installer who came to install meters after we were on the record with We Energies and the PSC as not wanting an AMR meter installed.

23. We were concerned that we would find AMR meters installed despite our clearly expressed refusal to have AMR meters, so we padlocked our meter pedestals and installed clearly worded permanent signage.

24. In response to our continued refusal to allow installation of the meter, we were threatened with disconnection. (See WeEnergies9Dec2011.pdf)

25. Both We Energies and the PSC maintained, over the phone and at a meeting with our state legislators, that we had three choices and represented them as accommodation.
    1. Take the AMR meters.
    2. Take the AMR meters and move them anywhere on our property at our considerable expense (thousands of dollars to move them even short distances).
    3. Get off-grid.

26. We do not consider these choices to have been any form of accommodation since we could not have moved the meters far enough to protect our health. Also, the radiofrequencies the meters produce get on the wires, essentially turning the house into a low-power microwave. This proved to be a problem even though our nearest neighbor is over half a mile away. Having two meters of our own would have worsened the effect.

27. We consider the refusal to accommodate us and the threat to disconnect us to have been bullying and intimidation on the part of We Energies and the Wisconsin Public Service Commission.

28. My wife met, as part of a group, with state legislators (Sen. Grothman, Rep. Jorgensen, and Connie Schulze, a staff-member of Sen. Darling's, who were supportive, but unwilling to sponsor legislation to help us.

29. My wife called numerous federal agencies - to no avail.

30. In March 2011, we received a letter from We Energies threatening to disconnect us within 48 hours for denying them access to the meter pedestal, which we own. This, in spite of the fact that, during a conversation about the supposed safety issue and the fact that We Energies can easily disconnect power to our farm at our transformer in case of an emergency, Tom Held (Supervising Engineer Meter Technology) concurred saying "I know. They can pull the fuse."

31. We had been customers in good standing.

32. Again we appealed to the PSC (PSCMarch2011WEcutoff.pdf) for accommodation under the ADA and asked that they address the radiation coming off of our transformer and causing cardiac arrhythmia for our son, only to be told that they would stand by and watch us disconnected, although they would make We Energies wait until after April 15. They did not address the dangerous radiation at all.

33. After consulting multiple lawyers, realizing that the sole power to provide or deny accommodation resided with the PSC, and even being told outright by one lawyer that our best bet was to get off the grid, we began making preparations -at considerable expense- in case we were forced off-grid, fighting all the while.

34. We got a propane refrigerator, a pilot light gas stove, installed a gravity flow hot water heating system, acquired a generator to run our commercial freezer and installed a solar photovoltaic system to run a new DC well pump and sump pumps and converted our computer to run on DC.

35. We felt that the PSC was in violation of its own statutes in standing by and watching customers in good standing get disconnected and that We Energies was in violation of the law, but with no one to defend us, we had no recourse other than the one easily accessible public forum - a Letter to the Editor. (We had contacted various legal organizations

including the ACLU, Public Citizen, Common Cause, and NRDC. All said that they have limited funding and they had never heard of this before. News outlets were similarly uninterested - utilities and telecom companies provide substantial funding through advertising or outright ownership.) We did also reply to the PSC.

36. The PSC once again refused to exercise their right to stop We Energies from disconnecting us for refusing the transmitting meter.

37. The PSC refused to accommodate us in large part because the AMR meters were supposedly in compliance with FCC radiofrequency limits (see PSC27Apr2011reDATCP.pdf), in spite of the fact that FCC limits were never intended to protect anyone from the biological effects we experience. Compliance with FCC limits has been used to force many many people from across the country to have devices which compromise their health.

38. After we wrote the letter to the editor, Sue Crane, Manager Special Projects at We Energies contacted us and asked that we remove the padlock stating that she would personally guarantee in writing that the meters would not be changed for 6 months.

39. We are currently essentially housebound, unable to spend significant time in houses or businesses which have transmitting meters, which includes almost every electrical service in our area.

40. Due to the detrimental health effects that we experience, we are unable to visit friends and relatives who have transmitting meters.

41. My parents tried to refuse to take a transmitting meter so we would still be able to visit and were bullied into taking the meters by a disconnect threat. We can no longer visit. Our one try was cut short by our younger son feeling so ill that he was crying and begging to leave - in spite of it being Christmas with relatives, presents, and candy.

42. On October 8, 2011, we sent letters to the PSC and We Energies requesting that they remove our electrical service since they had repeatedly ignored our requests to address the problems on their system that were causing large amounts of very high frequency radiation to radiate off of our transformer and our house wiring.

43. We had been forced to sleep in a tent a half mile from our home site (and at least that from other electrical services) from the end of July through October 13, 2011 - the start of early deer hunting season - in order to stabilize our sons' cardiac health. (From the start of deer hunting until the secondary wires were removed on October 19, 2011 we slept in the bed of our full-sized truck parked in our metal machine shed with the openings facing the transformer electrically shielded and the bed opening away from the transformer. The electrical service to the shed was already disconnected thus preventing it from conducting the radiofrequencies in.)

44. Both sons were affected, although our younger son was affected more severely. After initial tachycardia incidents which we became aware of in the fall of 2010, they moved on to

irregular heartbeat and heart rate which finally got quite slow and irregular, particularly during sleep. Additionally, Holter monitoring found that both boys had sinus arrhythmia. This is consistent with the descriptions of stages one and two of radiofrequency sickness in Dodge (attached). On a Holter monitor, our younger son only had a high of 242 bradycardia incidents hourly at the tent versus 1637 hourly at home. Our older son had a high of 165 bradycardia incidents hourly at home with no comparable due to a mistake on part of the hospital. Our younger son's heart rate got so slow one night when we were forced by broken tent poles to sleep at home that he lost bladder control, wetting only his underwear because the volume of urine was so small. When my wife went to him in response to his call, he was agitated and upset, but his heart rate was very slow and the beats were weak and irregular. This continued for a couple of hours. We did not sleep in the house again after that until after the secondary lines were removed.

45. The deterioration in our health began shortly after the smart meters were installed in our area. Strong power line communication signals (likely related to broadband over power lines) in the 12.4 to 13.2 MHz and 25.5 to 26.3 MHz range radiating from our end of the line transformer and our home wiring seem to have been the final straw.

46. Signals in the 1 MHz to 80 MHz range used for broadband over power lines are not supposed to cross the transformer. However, what happens when the signal hits the end of the line has not been considered as far as I know. Our experience suggests that it radiates and does cross the transformer enough to radiate off of the wiring and plumbing throughout the house at biologically-harmful levels.

47. We are now off-grid to try to protect our family's health.

48. I am a beekeeper. My bees used to be healthy. The increased radiofrequency radiation in the last couple of years has not been good for their health. We lost all of our hives over winter the past two years. Last year, with removing the transformer and its radiation from our yard, 80% survived the winter. Radiofrequency radiation can interfere with bee navigational abilities, impair their immune systems, and therefore decrease the health and vigor of my hives. Please see "The Birds, the Bees and Electromagnetic Pollution" by Dr. Andrew Goldsworthy, May 2009, for more information.

49. After going completely off-grid, I had three heavenly weeks. I slept well, felt well, and had lots of energy. Our pets' health improved. Most importantly, our sons' cardiac rhythms had almost completely normalized.

50. Then, in early January 2012, 4G cellphone service was installed in our area. Within a week, our sons' cardiac rhythms were again highly irregular. Our younger son was again waking us in the night crying and feeling unwell with a highly irregular cardiac rhythm.

51. I screened all the windows with aluminum screen to reduce his exposure. Again, he slept through the night and was less clingy, but their cardiac rhythms remained irregular.

52. We cannot completely escape the constant exposure from neighbors transmitting utility meters, 4G cellphones, and the power line frequencies which still radiate from the junction box down the road that terminates the line.

53. As 2012 passed, we had to do more and more shielding to compensate for the ever increasing levels of radiation from wireless technology. We have had to restrict the amount of time our outdoors-loving sons can be outside. They are now only able to be out an hour a day. If they are out more than that with any regularity their cardiac arrhythmias become severe enough that they become clingy and we are awakened in the night.

54. We do not want to continue to be guinea pigs for the government-sanctioned rollout of new technologies with insufficient safety standards. We do not want to continue to be part of the experiment being involuntarily carried out on the American people verifying the results of decades old research showing that the long-term health effects of these wireless signals can be profound and dangerous. (See Dodge)

55. I often wonder how I am going to be able to perform the planting, cultivating, harvesting, and animal care duties, as well as building maintenance projects, since I also feel unwell if I have to spend too much time outdoors.

56. I wonder if I will get to see my sons grow to adulthood together or if one or both will have their lives cut short by the lack of meaningful biologically-based safety limits for radiation from wireless devices. They are sweet intelligent wonderful children and do not deserve to suffer or pay the final price so telecom companies can make more money.

57. Our situation perfectly illustrates the absolute inadequacy - irrelevance even - of the FCC radiofrequency radiation limits for protecting human health. These adverse effects are happening at levels far below existing radiofrequency radiation limits.

58. The levels of radiation our family experiences on a daily basis from transmitting utility meters, cellphones, cell towers, wireless broadband, and other sources, - WITHOUT OUR PERMISSION - is already causing serious daily health problems for us. (All from devices that are supposedly individually compliant with the meaningless thermally-based FCC radiofrequency radiation limits.)

59. The FCC has no expertise for evaluating radiofrequency research and setting biologically-based safety limits. The FCC is not serving the public well by allowing the public health to be endangered by their lack of expertise. The FCC needs to tell Congress that they lack the needed expertise and ask Congress to provide funding to the EPA and invest them with the authority to set the biologically-based safety limits necessary to protect the public health and safety.

60. Without conservative safety standards designed to protect the public health of our entire population during continuous exposures from all detrimental health effects and the rigorous enforcement of such standards, we fear the long-term hazards to our family's health.

61. We have a right to be safe in our homes and our schools and workplaces, and we have a right to current safety standards based on current science, not mistaken assumptions (the thermal model) and wishful thinking.

62. The existing FCC radiofrequency radiation exposure limits are way too high. Severe biological effects occur at far lower levels, as demonstrated by my family's experience, as well as in studies. If the FCC persists in ignoring this fact and does not adopt biologically-based radiofrequency radiation safety limits, it will be directly responsible for the ill health, even death, of millions of people. (See the 2012 BioInitiative Report - http://www.bioinitiative.org/ - for mechanisms and diseases for which links have been made in recent scientific literature and Dodge - incorporated by reference herein in its entirety http://www.magdahavas.com/wordpress/wp-content/uploads/2010/08/Dodge_1969.pdf - for connections made over 40 years ago.)

63. I reaffirm that the information contained in the paragraphs above are true and correct.

64. End of affidavit.

Dated this eighteenth day of February 2012.

Exhibit D

we energies

231 W. Michigan Street
Milwaukee, WI 53203
www.we-energies.com

December 9, 2009

Mr. and Mrs. Dan Kleiber
N9387 Riverview Drive
Waterloo, WI 54594-9463

Dear Mr. and Mrs. Kleiber:

I received your recent contact regarding We Energies' ongoing plan to upgrade the electric and gas meters of our customers. You have been provided information regarding the installation of a new meter and have requested not to have the new technology installed. Enclosed you will find the original letter that was sent to you.

I am providing for your information the following sections of the Wisconsin Statutes and the Wisconsin Administrative Code, which give We Energies the authority to gain access to install the new meter and to disconnect residential customers who refuse to provide access to install the new meter.

> Wis. Stat. s. 196.171 Examination of meters, pipes, fittings, wires and works;
> (1) Any officer or agent of any public utility furnishing or transmitting water, gas or electric current to the public or for public purposes may enter, at any reasonable time, any place supplied with gas, electricity or water by the public utility, for the purpose of inspecting, examining, repairing, installing or removing the meters, pipes, fittings, wires and works for supplying or regulating the supply of gas, electricity or water and for the purpose of ascertaining the quantity of gas, electricity or water supplied.
>
> PSC 113.0301 Disconnections, residential;
> (1m) Residential utility service may be disconnected or refused for any of the following reasons:
> (k) Refusal or failure to provide authorized utility personnel access to utility equipment.

Please feel free to call me at (414) 221-2769 with any additional questions.

Sincerely,

Susan Crane

Susan Crane
Director – Meter to Bill Process

Exhibit D

Public Service Commission of Wisconsin

Eric Callisto, Chairperson
Mark Meyer, Commissioner
Lauren Azar, Commissioner

610 North Whitney Way
P.O. Box 7854
Madison, WI 53707-7854

April 27, 2010

Ms. Catherine Kleiber
N9387 Riverview Drive
Waterloo, WI 53594

Re: Meter Complaint forwarded from Department of Agriculture, Trade and Consumer Protection

Dear Ms. Kleiber:

On April 21, 2010, the Department of Agriculture, Trade and Consumer Protection (DATCP) forwarded a complaint to our agency that you had filed with them concerning the automated meter reading (AMR) electric meters being installed by We Energies.

Regulation, licensing, and safety of radio frequency equipment rests with the Federal Communications Commission (FCC). The FCC is required by the National Environmental Policy Act of 1969 to evaluate the effect of emissions from FCC-regulated transmitters on the quality of the human environment. The AMR meters used by We Energies comply with FCC safety standards.

For the few electric customers that have expressed health concerns with the AMR technology We Energies has given them the option of choosing to move their electric meters away from their house to another location on their property, at the customer's expense. There is no basis for the Commission to require We Energies to take any further or different action. Pursuant to Wis. Admin. Code § PSC 113.0809, the utility determines the type of metering equipment to be installed and its location.

If you have further questions, please feel free to contact me at (608) 267-3595.

Sincerely,

Terri K. Kosobucki

Terri K. Kosobucki, P.E
Senior Engineer
Gas and Energy Division

TKK:mem:L:\Letter\2010\Kleiber-DATCP complaint response

cc: Susan Crane, We Energies

Exhibit D

Dan and Catherine Kleiber
N9387 Riverview Dr.
Waterloo, WI 53594
(920) 478-9696

Commissioner Eric Callisto
Commissioner Mark Meyer
Commissioner Lauren Azar
Public Service Commission of Wisconsin
610 North Whitney Way. P.O. Box 7854
Madison, Wisconsin 53707-7854

March 19, 2011

Dear Commissioners,

I have enclosed a copy of the letter we received from We Energies giving us 48 hours notice of electrical service cutoff. We are customers in good standing and there is NO safety hazard.

We Energies wishes to disconnect us in retaliation for not allowing them to place their dangerous transmitting meters on home and farm electrical services. However, they do not want to cut off our electricity on April 15 only because we refuse to take a dangerous meters, so they are striving to create justification for doing so. In so doing, they are violating PSC 113.0508.

The padlocks have been on the meter pedestals, equipment we own, for nearly two years. The purpose is not to deny access to We Energies for any legitimate maintenance need, but to prevent them from installing a transmitting meter we know to be dangerous to our health. Others have merely put signs and requested that We Energies not install the transmitting meters. Those requests were not honored and they are now sick. And We Energies refuses to remove the meters.

We Energies does not have the right to install equipment on our home and farm that is dangerous to us so we have padlocked OUR meter pedestals to assure that they accommodate our disability as required by the Americans with Disabilities Act (ADA).

The situation is not dangerous or urgent. The locks have been in place for nearly two years. They do not pose a threat in an emergency situation because, according to the Jefferson County Sheriff's Office, We Energies will get called in the event that an emergency shutoff is needed. They can easily disconnect power to our home or farm buildings by pulling the fuses in the transformer - the most easily accessible and highly visible piece of electrical equipment in our yard. The threat to terminate our power is bullying, intimidation, and harassment, a violation of PSC 113.0508. I spoke with Tom Held, Supervising Engineer Meter Technology, on October 18, 2010 when he initially voiced this concern - nearly a year and a half after initial installation of the padlocks - and pointed out the lack of safety issue, as I have just laid out. He concurred saying "I know. They can pull the fuse." And, after understanding the reason we had the

padlocks in place and acknowledging the lack of safety threat, he said "I'm not saying you have to take it [the padlock on the meter] off." He also apologized a couple of times for disturbing me during the conversation after understanding that there was no safety issue. I last spoke with Sue Crane on December 17, 2010 regarding this issue. Obviously, this is not a real safety issue or it would not have taken until March to take action, unless they are negligent. (During that conversation she again reiterated that they would not accommodate us and would either install the transmitting meter or cut us off.)

Cutting off the power of customers in good standing (us) who are merely trying to protect our family's health, would be unconscionable (PSC 113.0507(1)). As such, the PSC has a duty and latitude PSC 113.01(2) to prevent this. Disconnection of our service without cause, as this would be, is in violation of PSC 2.11(2). Failure to prevent our disconnection and require accommodation of our disability would result in the PSC being in violation of Title II of the ADA. Accommodation is simply a matter of requiring We Energies to allow us to keep our analog meters, which we would be happy to read and self-report using We Energies' existing automated call-in system, as allowed by PSC 113.0405. They can verify our honesty during their legally required meter check every six months.

While we are not causing an unsafe situation, We Energies is. The transmitting electrical meter they are forcing on their customers is not UL listed. No UL number appears on the meter face and two separate UL employees could not find a listing for the GE Model I-210 meter in their system. Transmitting electrical meters have been implicated in starting fires in California (http://www.turnto23.com/north_river_county/21601647/detail.html). The fire marshal should be made aware of this potential hazard so tracking can be done statewide and immediate removal can be mandated statewide if any problems are detected.

Fire is not the only hazard posed by the transmitting meters. Over 2,500 complaints about health problems related to the transmitting meters have been filed in California. Furthermore, two of the transmitting electrical meters being used in California have been found to be in violation of the FCCs inadequate safety guidelines when tested independently, in spite of being FCC licensed (http://sagereports.com/smart-meter-rf/). I know others are experiencing health problems as a result of transmitting utility meters (water, gas, and electric) in WI. The PSC should require the utilities to report health complaints they receive. They should have records as required under PSC 113.0610. They should also require the utilities to replace transmitting meters with analog meters, particularly where a doctor's letter requesting this accommodation is presented. Ours, which We Energies has copies of, are enclosed. Additionally, the PSC should require full disclosure of information related to the transmitters in all AMR meters and independent testing to verify the accuracy of the information. PSC 113.01(2) allows you to take these actions.

Additionally, installation of transmitting electrical meters, another source of radiofrequency interference, or degradation of We Energies equipment, has resulted in radiofrequency interference on the line which is radiating off of our transformer and causing cardiac arrhythmias for our son. PLEASE REQUIRE WE ENERGIES TO REMEDY THIS AT ONCE. (PSC 113.0707 and PSC 113.0201)

Again, there is no safety violation on our part. The PSC will be in violation of PSC 113.0507(1) on unconscionability, PSC 2.11(2) on service disconnection and Title II of the ADA if they do not prevent We Energies from terminating our electrical service and require them to accommodate us. However, it is imperative that We Energies be immediately required to remedy the unsafe situation resulting in radiofrequency radiation radiating from our transformer and causing cardiac arrhythmia in our young son.

I hope the PSC will exercise the authority granted under PSC 113.01(2) in order to fulfill their charge to "Oversee and facilitate the efficient and fair provision of quality utility services in Wisconsin" and:

1. Require reporting of health complaints about transmitting meters filed with utilities by ratepayers.
2. Require remediation - replacement of transmitting meters with analog meters.
3. Require full disclosure of information related to the transmitters in all AMR meters and independent testing to verify the accuracy of the information and compliance with FCC guidelines.
4. Notify the fire marshal of the potential hazard posed by these non-UL listed meters so proper reporting and recall can be done.
5. Fund truly independent epidemiological studies to track population health changes subsequent to transmitting meter installation.

Thank you for assistance.

Sincerely,

Dan Kleiber and Catherine Kleiber

cc:
Sue Crane
Rep. Jorgensen
Sen. Fitzgerald
Waterloo Fire Department
Waterloo Police Department
Jefferson County Sheriff's Office
Attorney General J.B. Van Hollen
State Fire Marshal Tina R. Virgil
Department of Health Services Secretary Dennis Smith

Tina R. Virgil ; State Fire Marshal
Wisconsin Division of Criminal Investigation
PO Box 7857
Madison WI 53707-7857

Tina R. Virgil
Bureau Director / State Fire Marshal
608-266-1671
virgiltr@doj.state.wi.us

Joell E. Schigur
Special Agent In Charge
608-266-1671
schigurje@doj.state.wi.us

Public Service Commission of Wisconsin
610 North Whitney Way. P.O. Box 7854
Madison, Wisconsin 53707-7854
Phone:(608)266-5481

Public Service Commission of Wisconsin
P.O. Box 7854
Madison, WI 53707-7854.

DHSwebmaster@wisconsin.gov

Department of Health Services
1 West Wilson Street
Madison, WI 53703

General Phone Number: 608-266-1865,
TTY Phone Number: 888-701-1251.

You can find staff phone numbers and e-mail addresses for DHS programs using the Directory of Department Services.

DOJ Office of Consumer Protection:
(800) 998-0700 or (608) 266-1852

Contact the Department of Justice

If you would like to contact the Wisconsin Department of Justice by telephone, please call: 608-266-1221

If you would like to write to the Wisconsin Department of Justice, please direct all communication to:
Wisconsin Department of Justice
P.O. Box 7857
Madison, WI 53707-7857
Fax: 608-267-2779

The Wisconsin Department of Justice headquarters is located in the Risser Justice Center, 17 West Main Street, in Madison.

If you would like to serve a notice of claim [PDF form] upon the Attorney General under Wis. Stat. 893.82, please direct such claim to:
Attorney General J.B. Van Hollen
114 East State Capitol
Madison, WI 53707-7857

Fire Chief Vern Butzine
Waterloo Fire Department
900 Industrial Lane, Waterloo Wisconsin 53594
Phone: (920) 478-2535
Fax: (920) 478-9597

Chief Timothy Thomas
Waterloo Police Department
136 N. Monroe St
Waterloo, Wi. 53594-1125
email: police@waterloowi.us
Ph. (920) 478-2343
Fax (920) 478-4746
Emergency 911

PSC Commissioners

The PSC is composed of three full-time Commissioners who decide the cases brought to the PSC for changes in utility operations, rates and for construction projects after a complete and thorough review of all the records compiled in the case, including public comments. Commissioners are appointed by the Governor and confirmed by the State Senate for staggered, six-year terms.

One of these Commissioners is appointed chairperson by the Governor for a two-year term. The Commissioners' Office, under the direction of the Chairperson, has oversight of all PSC staff related activities.

Eric Callisto was appointed Chairperson of the Public Service Commission of Wisconsin in May of 2008.

Prior to his appointment, he was the Executive Assistant to the Chairperson of the PSC. His previous Wisconsin state government positions include Administrator of the Division of Enforcement at the Department of Regulation and Licensing and Assistant Legal Counsel to Governor Jim Doyle.

From 1997 through 2003, he was an Assistant Attorney General at the Wisconsin Department of Justice, in both the Environmental Protection and Civil Litigation units. He has worked as a public defender in New York City and Philadelphia, and as a policy advisor at the U.S. Environmental Protection Agency in Washington D.C.

He has a law degree from the University of Wisconsin-Madison and a B.A. in Environmental Sciences from the University of Virginia.

If you would like to contact Chairperson Callisto, please send him an e-mail at: Sandra.Paske@wisconsin.gov.

Mark Meyer was appointed Commissioner of the Public Service Commission by Governor Jim Doyle in September 2004.

Commissioner Meyer has an extensive legislative background, serving in both the State Assembly and Senate and previously working in the U.S. Congress.

Before joining the PSC, Commissioner Meyer served as Senator for the 32nd Senate District in western Wisconsin. As Senator, Commissioner Meyer served on numerous legislative committees including the Energy and Utilities; Transportation and Information Infrastructure; and Economic Development, Job Creation and Housing committees. He also served on the State Building Commission.

Exhibit D

Dan and Catherine Kleiber
N9387 Riverview Dr.
Waterloo, WI 53594
(920) 478-9696

Commissioner Phil Montgomery
Commissioner Eric Callisto
Commissioner Lauren Azar
Public Service Commission of Wisconsin
610 North Whitney Way. P.O. Box 7854
Madison, Wisconsin 53707-7854

April 11, 2011

Dear Commissioners,

We are very disappointed with your apparent disregard for our family's health. We sent you two doctor's letters asking that we be accommodated by being allowed to keep our existing electrical meters for the sake of our health. You have disregarded both.

Moving the meters is extremely costly, even for a short distance, and would not address our health problems with the meters. It is not an accommodation. The meters transmit over a range of miles. Getting the meters that far away would be impossible.

The California Public Utility Commission is in the process of requiring PG&E to provide an opt-out program (see included news article) in recognition of the fact that these meters are dangerous for a segment of the population. (Other states are also working toward opt-out programs.) Adversely affected individuals include people with heart conditions, implanted medical devices, and radiofrequency sickness. A blinded study reports heart arrhythmias upon exposure to cordless phones [1]. Transmitting utility meters are causing similar problems for some people. Others begin experiencing the symptoms of radiofrequency sickness. Those of us who already have radiofrequency sickness relapse immediately. I know that you have received complaints about this from others because I am in contact with many of them.

Statutorily the PSC would be able to require that the utilities have an opt-out program. PSC 113.01(2) gives the commission this latitude. Again, even Tom Held, Supervising Engineer Meter Technology, from We Energies admitted that there is NO safety problem here since We Energies linemen can easily disconnect power to our buildings in the event of an emergency by removing the fuse in our transformer. So, for the PSC to allow our disconnection on this basis is disingenuous. To allow disconnection based on denial of access to utility equipment is also ridiculous since we are only not allowing installation of equipment that is dangerous to our health, not denying access for legitimate maintenance.

Your reply also completely ignored the dangerous situations created by We Energies. One, radiofrequency interference on the utility electrical wiring is radiating from their transformer in

our yard and causing health problems for us. My sons are experiencing heart arrhythmias and our entire family is experiencing poor sleep and fatigue as a result. Again, this must be remedied by We Energies (PSC 113.0707 and PSC 113.0201). Two, the meters are not UL approved and are a likely fire hazard.

We are very disappointed by your refusal to protect the health of the citizens of Wisconsin by allowing those of us for whom transmitting utility meters are dangerous to opt-out and retain our existing meters.

In the face of your clear abandonment of your duty to protect the citizens of Wisconsin from the abuse of utility power (PSC 113.0508), we have no other choice but to require you to have We Energies remove their wires and transformer from our property. Once that is done, we will open our meter pedestals and We Energies may remove their meters, if they like.

Sincerely,

Dan and Catherine Kleiber

1. Havas, J. Marrongelle, B. Pollner, E. Kelley, C.R.G. Rees, L. Tully. Provocation study using heart rate variability shows microwave radiation from DECT phone affects autonomic nervous system. Eur. J. Oncol. Library, vol. 5, 2010

cc: Sue Crane
Rep. Jorgensen
Sen. Fitzgerald

Exhibit D

Melrose-Mindoro

N181 State Rd. 108 • Melrose, WI 54642

Ron Perry, Superintendent
Del Deberg, High School Principal
Tracy Dalton, K-8 Principal

High School – (608) 488-2201 or (608) 857-3417
Fax – (608) 488-2805
Melrose Elementary – (608) 488-2311
Mindoro Elementary – (608) 857-3410

CHANGES NOTED SINCE FILTERS INSTALLED

In the years previous to the filters being installed, several children required inhalation treatments for their asthma in the spring and in the fall. Many of them required nebulizer treatments once or twice a day while at school. I have not had to administer one nebulizer treatment this past year and of the 37 students with inhalers, only three of them use the inhaler for their exercise-induced asthma before Phy Ed.

Teachers are stating they are less fatigued and tired.
The sense of smell has come back for me. I lost it for three years and the doctors said it was my allergies.
The students seem to have more energy and appear and seem less tired.
Several staff who doctored regularly for allergies have not had to take medication or see their doctor because they are having less problems.
Students whom have been diagnosed with migraine headaches have had their headaches reduced no headaches at all.
I feel that our faculty and students have had improved health overall since the filters have been installed.

Char Sbraggia R.N.
District Nurse

Exhibit D

The Birds, the Bees and Electromagnetic Pollution
Dr. Andrew Goldsworthy
May 2009

How electromagnetic fields can disrupt both solar and magnetic bee navigation and reduce immunity to disease all in one go

Many of our birds are disappearing mysteriously from the urban environment and our bees are now under serious threat. There is increasing evidence that at least some of this is due to electromagnetic pollution such as that from cell towers, cell phones, DECT cordless phones and Wifi. It appears capable of interfering with their navigation systems and also their circadian rhythms, which in turn reduces their resistance to disease. The most probable reason is that these animals use a group of magnetically-sensitive substances called *cryptochromes* for magnetic and solar navigation and also to control the activity of their immune systems.

Birds are very sensitive to electromagnetic fields and some may find the electromagnetically polluted urban environment no longer tolerable. Migratory birds may also lose their sense of direction and never reach their intended destination, perhaps just falling into the sea on the way. Bees are even more under threat and are extremely important to us. Without bee pollination, there would be very few brightly colored or scented flowers in the countryside or in our gardens and many of our crops would be devastated. We would be left just with crops that are wind pollinated (mostly cereals) that do not on their own provide a healthy balanced diet, nor do they act as host to the friendly nitrogen fixing bacteria that are essential to the sustainable fertility of our soil. This may be a very heavy price to pay for our unrestricted use of cell phones and other forms of wireless communication.

What are cryptochromes?

The cryptochromes are a group of pigments found in virtually all animals, plants and many bacteria. They consist of a flavin (a derivative of vitamin B2-) folic acid and protein. Like all pigments, they get their colour by absorbing light at specific wavelengths. The cryptochromes absorb blue-green and ultra-violet light and use its energy to drive *photochemical reactions* where light energy is converted to chemical energy. The earliest cryptochromes used this energy to repair damaged DNA. However, more modern ones have evolved in both animals and plants where they measure light to reset their biological clocks. In some animals, they also sense the direction of the Earth's magnetic field. Unfortunately, cryptochromes are very badly affected by weak oscillating

electromagnetic fields that are orders of magnitude weaker than the Earth's steady magnetic field. This can disrupt both solar and magnetic navigation, which can account for colony collapse disorder in bees, the loss of some migratory birds and butterflies and a weakening of the immune system in many more organisms.

How cryptochrome measures light

The energy of light is used to transfer an electron from one part of the cryptochrome molecule to another to form a pair of what chemists call *free radicals*. The electron finds its way back of its own accord to restore the *status quo*, but this takes longer and results in an accumulation of cryptochrome in the free radical form. It soon reaches equilibrium when the rate of free radical formation equals its rate of destruction, at which point the proportion in the free radical form is a measure of the current brightness of the light.

How cryptochrome senses magnetic fields

This depends on the fact that free radicals are affected by magnetic fields. Steady magnetic fields delay the return of the displaced electron so that there is an even greater accumulation of cryptochrome in the free radical form. This can be sensed by the cell in the same way as it senses the effect of light. The direction of the field can be found by having an array of cryptochrome molecules oriented in different directions, as they would be in the compound eye of an insect or in the retina of a vertebrate's eye. Most of the cryptochrome is found in the eyes, but it is quite distinct from the regular visual pigments (rhodopsins) that are used in normal vision. However, their combined effect gives the animal the potential to "see" the direction of the magnetic field, possibly as an extra colour superimposed on its field of vision.

Oscillating magnetic fields severely disrupt cryptochrome function.

Ritz and co-workers (Nature Vol. 429 13th May 2004 pp 177-180) showed that, provided they were given light of the wavelengths absorbed by cryptochrome , robins could orient themselves for navigation in the Earth's magnetic field. However, this was severely disrupted by the application of extremely weak alternating electromagnetic fields. A broad spectrum of frequencies between 0.1-10MHz at field strengths as little as 0.085 microtesla (about 500 times weaker than the Earth's field) made the birds completely unable to respond to the Earth's field! The quantum mechanics of the process suggest that these alternating fields are likely to be perceived as a blinding "*magnetic light*" that blots out the bird's "*magnetic vision*".

Mobile telecommunications generate similar fields.

Microwaves that are modulated to carry digital information generate a similar broad spectrum of frequencies in this range. These frequencies occur in most mobile

telecommunications, including cell phones, DECT cordless phones and Wifi. These too may blot out "*magnetic vision*". In real life, even lower field strengths are likely to disturb magnetic navigation, since radiation that is too weak to blot out *magnetic vision* may still be strong enough to distort the bird's perception of the Earth's field so that it flies in the wrong direction.

Their sheer numbers may also be a problem.

What may be even more important is the sheer multiplicity of modern-day wireless devices; most western households have several. They may suddenly burst into life and/or be mobile; so as to give the birds continually conflicting navigational data. Many may find this disturbing. It's like being constantly bombarded from all directions by the flashing lights of a disco. We should not be too surprised to find that these birds may choose to leave the area.

Bees may not like the radiation either.

Like the birds, bees may also find electromagnetic fields disturbing, and choose to leave the area. Scientists who put DECT cordless phone base stations (cheap sources of modulated microwaves) next to their beehives found that they made the bees behave abnormally and were less likely to return to the hive (**http://tinyurl.com/rans84**). Based on this observation, beekeepers would be well advised to switch off their cell phones when visiting their hives. Even when not in use, cell phones periodically emit bursts of radiation at full power so that the phone company can keep track of where you are.

Cryptochrome and solar navigation

Many animals, including birds and bees, can also navigate by using the position of the sun. But in order to do this, they must have an internal clock to compensate for its changing position throughout the day. The mechanism of this clock has been extensively studied in mutants of the fruit fly *Drosophila.* It uses cryptochrome to sense the light-dark transitions at dawn and dusk to reset its clock and also to keep it running at the correct speed. Unfortunately, the use of cryptochrome also makes the clock sensitive to magnetic fields. Yoshii *et al*. found that a 300 microtesla steady field could alter the speed of the clock or even stop it altogether. (Yoshii *et al*. **http://tinyurl.com/cx7xaa**) They didn't test weak alternating fields, but given the findings of Ritz *et al*. and the fact the sensing of light and magnetic fields by cryptochrome uses the same basic mechanism, it is likely that these too would disrupt the clock's normal functions. The consequence of this would be that electromagnetic fields of this sort would render the animal unable to compensate accurately for the changing position of the sun. This means that both solar and magnetic navigation would fail together and, if there were no landmarks to guide it, the animal would be completely lost. This could explain colony collapse disorder when bees do not return to the hive, why it is so prevalent in the featureless almond plantations

of the USA and why there are increasing losses of animals that have the option to use both.

Circadian rhythms are affected too

Circadian rhythms are natural metabolic rhythms that occur in virtually all higher organisms. They too are driven by the biological clock so that the organism can *anticipate* the coming of dawn and dusk and modify its metabolism to be ready for the new conditions. Many metabolic functions are controlled in this way. These include the rhythmic production of melatonin (a sleep hormone) and the diversion of metabolic resources from physical activity during the day, to repair and the immune system at night.

Consequences of losing the circadian rhythm

If the rhythm were to be lost or become weaker due to a failure of the clock as a result of electromagnetic exposure, it would have serious consequences. In humans it would result in tiredness during the day, poor sleep at night, and a reduced nightly production of the sleep hormone melatonin. All of these effects have been reported in people exposed to the radiation from cell towers and other sources of continuous weak electromagnetic radiation such DECT phone base stations and Wifi routers. Also, any weakening of the amplitude of these rhythms means that **at no time will any process controlled by them ever function at maximum power.** In particular, the immune system may never be able to summon up the overwhelming power that is sometimes needed to overcome pathogens or to destroy developing cancer cells before they get out of control. This could in part explain the increased risk of cancer often found in epidemiological studies of people living near mobile phone base stations. It may also be an important factor in the continuing reduction in the health of our bee population and its apparently reduced ability to resist pathogens.

Andrew Goldsworthy BSc PhD

May 2009

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Radiation from wireless technology elevates blood glucose and body temperature in 40-year-old type 1 diabetic male

Catherine E. Kleiber

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ORIGINAL ARTICLE

Check for updates

Radiation from wireless technology elevates blood glucose and body temperature in 40-year-old type 1 diabetic male

Catherine E. Kleiber

Independent Researcher, Waterloo, WI, USA

ABSTRACT

A type 1 diabetic male reports multiple instances when his blood glucose was dramatically elevated by the presence of microwave radiation from wireless technology and plummeted when the radiation exposure ended. In one instance, his body temperature elevated in addition to his blood glucose. Both remained elevated for nearly 48 h after exposure with the effect gradually decreasing. Possible mechanisms for microwave radiation elevating blood glucose include effects on glucose transport proteins and ion channels, insulin conformational changes and oxidative stress. Temperature elevation may be caused by microwave radiation-triggered Ca $^{2+}$ efflux, a mechanism similar to malignant hyperthermia. The potential for radiation from wireless technology to cause serious biological effects has important implications and necessitates a reevaluation of its near-ubiquitous presence, especially in hospitals and medical facilities.

ARTICLE HISTORY
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KEYWORDS
Blood glucose; cardiac arrhythmia; diabetes; hyperthermia; insulin conformation; insulin resistance; ion channel; wireless

Introduction

In 2011, IARC classified radiofrequency (RF) radiation, including radiation emitted by common wireless technologies, as a class 2B human carcinogen (IARC, 2013). The US National Toxicology Program (NTP) recently released findings showing that RF radiation caused gliomas in the brain and schwannomas in the heart at nonthermal levels and caused significant DNA breakage (NTP, 2016; Wyde, 2016). The NTP expressed concern about the very serious public health implications of the findings. The Department of Interior statement "the electromagnetic radiation standards used by the Federal Communications Commission (FCC) continue to be based on thermal heating, a criterion now nearly 30 years out of date and inapplicable today" highlights the need for modernization of FCC RF radiation limits (Taylor, 2014). The 2012 BioInitiative Report, a comprehensive review of the electromagnetic fields (EMF)/RF literature, concludes that safety limits are magnitudes too high based on research evidence (Sage and Carpenter, 2012). The Environmental Protection Agency's Radiation Division has stated "The FCC's current exposure guidelines, as well as those of the Institute of Electrical and Electronics Engineers (IEEE) and the International Commission on Non-Ionizing Radiation Protection (ICNIRP), are thermally based and do not apply to chronic nonthermal exposure situations" (Hankin, 2002). Today's exposures to radiation from wireless technology are chronic; therefore FCC, IEEE and ICNIRP RF limits are not protective.

Methods

The subject has provided written consent to publish his non-identifying information in this case study.

Case study

The case of a slender 40-year-old male insulin pump-using type 1 diabetic (29 years duration) illustrates the potential severity of nonthermal biological effects from exposure to pulse-modulated microwave (RF) radiation emitted by common wireless devices. He maintains good blood glucose control (average HbA_1C 7.7) and tests frequently (average 10 times daily). He and his immediate family do not utilize wireless technology.

Event 1

On a week-long vacation to visit family, a wireless router caused his blood glucose to become very high (over 250 mg/dL). Repeated appropriate insulin boluses did not return it to normal, acceptable levels. The severity of the blood glucose control problem caused him to cut the vacation short in order to bring his blood glucose back to normal. Later, he figured out

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the cause – radiation from the neighbor's Microsoft Broadband Networking Wireless Base Station MN-700. This was verified on a subsequent trip when the router owner was kind enough to turn it off and the diabetic's blood glucose was normal, until the morning he left, when it increased. When he checked, the router had been turned on.

Event 2

A neighbor (and his active cellphone) rode within a foot of him in his combine, a grain-harvesting machine. Shortly after the neighbor entered, the diabetic's blood glucose began to increase. He took some insulin to try to bring it back down, but to no avail. Repeated appropriate boluses were also unsuccessful. His blood sugar was over 300 mg/dL the whole time his neighbor and cellphone were in the combine, a period of about 4 h. Eventually, his neighbor left, taking his cellphone with him. The diabetic's blood sugar immediately dropped to dangerously low levels (near 30 mg/dL) once he was no longer exposed to the RF from the cellphone. He did not immediately realize why his blood glucose had gone high since this was the first time he was exposed to a cellphone in close proximity for several hours in a row.

Event 3

After an essential 2-h government appointment at the local United States Department of Agriculture office, which forced him into close proximity to a WiFi-emitting computer and two functional smart phones (ringing during the appointment confirmed their operational status), he felt ill, was running a 101 F fever and had a blood sugar of 298 mg/dL. He had started the appointment feeling well with a normal temperature and blood glucose level. His reaction was self-limiting because he was able to return to a low RF home environment immediately. His fever and high blood sugar lasted for two days, in spite of appropriate insulin boluses, gradually subsiding until he felt "reasonably okay" on the third day.

The diabetic also found that exposure to RF increases his overall insulin resistance. Figure 1 shows the diabetic uses the most basal insulin on a consistent basis in the summer through fall, the seasons when he is most active, but also when he is most exposed to RF radiation at market, from the neighbor's cellphone while harvesting grain for him and just from being outside unprotected from the biologically active ambient RF levels. When he is inside during the winter, sedentary in his mostly shielded home, his basal insulin use declines. Basal rate changes can often be explained by RF exposure rather than activity changes.

In 2011, he spent about 22 h a week in the city vending at farmers markets during the spring, summer and fall. After the market season ended and he finished harvesting grain for his neighbor, he was no longer around cellphone radiation on a daily basis. He had to decrease his basal insulin rate. Over 38 d, it dropped 15.1%. Then, the ambient RF exposure at his home increased and his basal insulin use increased. After installing RF-blocking Tuff R insulation on half his home following another market season, his basal rate once again decreased significantly. Although his basal rate did increase during the subsequent market season, it stayed substantially lower than prior to shielding. His basal rate dropped 29.6% from the beginning of 2010 through the end of 2014, as the diabetic made a series of changes to reduce his RF exposure (Figure 1). Ultimately, he stopped attending markets due to neurological symptoms (tremor and jumping muscles), which disappeared once market ended and he was at home in his shielded environment.

Discussion

These events demonstrate the ability of radiation from wireless devices to have serious biological effects. The diabetic reports that his blood glucose has also elevated in response to exposure to "dirty" electricity, another mode of RF exposure.

The home he grew up in had aged, undersized electrical supply lines whose insulation was hanging off in strips by his early twenties. Split-bolt connections were present on the utility side of the service. Split-bolt connections can loosen over time with temperature fluctuations, resulting in arcing, as would the deteriorated insulation, and other poor connections in the old wiring. Arcing would have been a source of very high levels of RF on the wiring in his childhood home prior to his diagnosis. Electronics, dimmer switches, compact fluorescent lights and variable-speed motors all generate "dirty" electricity – RF polluting the 60 Hz electrical signal (Graham, 2002). Other case studies document that RF exposures from "dirty" electricity are biologically active, increasing insulin resistance and therefore blood sugar (Havas, 2006, 2008).

Two epidemiological papers examine the historical incidence of diabetes (Gale, 2002; Milham, 2010). Milham finds a significant correlation between electrification and increased rates of diabetes mortality, which he speculates might be due in part to the effect of "dirty" electricity. Gale concludes that increases in prevalence of type 1 diabetes through the last century must be linked to environmental factors. The timing of increases in diabetes rates seem to correlate to changes

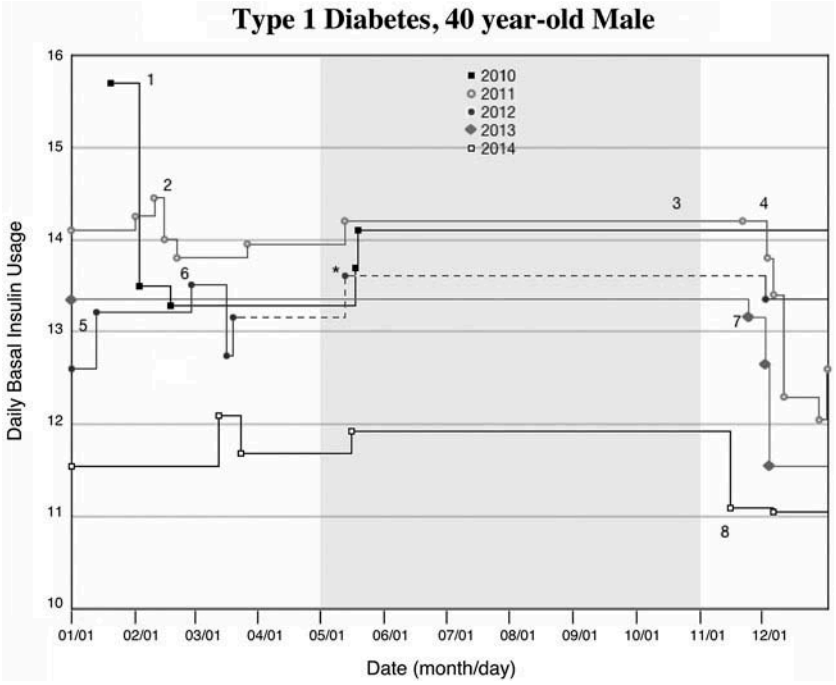

Figure 1. Changes in basal insulin rates through the year. Gray shading represents market season (May through October) and, therefore, higher RF exposure levels. Most changes in basal rate can be traced to changes in RF exposure.

(1) A prolonged harvest season working for a cellphone-carrying neighbor caused cellphone exposure into January. Basal rate dropped once no longer exposed.
(2) 18 Jan 2011 Ran DC well-pump for the first time on recently installed DC off-grid electric system. Running the system constantly with "dirty" charge controller and other polluting components may explain the brief rise in basal rates. Nonessential polluting components were removed. Then the system was run only while out of the house. 17 May 2013 Ordered new nonpolluting charge controller, installed shortly after.
(3) 19 Oct 2011 Utility disconnected and removed secondary electrical lines to building site. Lines were disconnected due to the RF (electrical pollution) they carried, causing cardiac arrhythmias for the diabetic's whole family.
(4) 20 Dec 2011 Fully off-grid. Utility disconnected primary electrical line a quarter mile from the building site.
(5) 6 Jan 2012 Notice that 4G cellphone service will be fully operational the next week.
(6) March 2012 - Weather unseasonably warm so diabetic was outside earlier than usual, then back in, and out again.
(7) Fall 2013 Shielded outside of half of house.
(8) Continued shielding house throughout 2014.

* exact date of basal rate change missing, basal rate known

in electrification and electrical usage, of which Gale was likely unaware. For example, rural electrification occurred in the US in the 1940s and the 1950s. The oil embargo in the 1970s led to the installation of energy-efficient lighting, a cause of "dirty" electricity. The rapid increase in home computer use in the early 1990s led to greater exposure to RF from computers and their screens as well as from the "dirty" electricity they generate. The beginning of widespread use of wireless technology in the mid-1990s added an additional source of RF exposure. Mandated use of compact fluorescent light bulbs, variable-speed motors in furnaces and smart utility meters have further increased levels of "dirty" electricity on home wiring. The epidemiological trend elucidated in both papers – increasing prevalence of diabetes tied to environmental factors – shows that the case reported here may be an observant example pointing to a widespread public health epidemic tied to growing exposure to RF from both wireless and "dirty" electricity.

Data cited in a review of Soviet literature related to the biological effects of exposure to RF radiation show the diabetic is not alone in noting an increase in his insulin resistance in response to RF. The review

discusses one study in which 75% of people working in RF fields were pre-diabetic (Dodge, 1969). The proliferation of wireless technology has resulted in the entire population living in RF fields 24/7.

Comparison of two groups of normal teenage males found a small but significant difference in HbA_1C levels and a greater risk of type 2 diabetes in the more highly RF exposed teenagers (Meo et al., 2015). Both exposure levels were far higher than the RF levels affecting the diabetic's insulin sensitivity. Many RF biological effects show a sigmoid curve – a rapid change at very low levels, reaching a plateau with a nearly steady level of biological effect even as exposure levels change by several orders of magnitude (Belyaev, 2012). A sigmoid curve would be expected if RF achieved nearly complete interference with a specific cellular process very quickly at the levels studied. Differences in exposure within the middle of that exposure range would only be expected to display very small effects, whereas a small decrease at the very low end of the exposure range could show a much larger effect. Thus, the large effect a small change had on the diabetic's blood glucose and insulin sensitivity is consistent with the proposed mechanisms.

The effects documented in Figure 1 occurred due to changes in RF levels far lower than those emitted by wireless devices (300 to over 2,000 microW/m ^{2}). For instance, one shielding project resulted in decreases of 0.2–2.8 microW/m ^{2} and max RF peaks less than half the previous levels. Resultant ambient levels within the home were about 3.3 microW/m ^{2}. Measurements of ambient RF radiation in 2015 at the markets he previously attended found levels from 90 to over 200 microW/m ^{2} at one market during market hours and from 180 to 521 microW/m ^{2} in the empty parking area where the other was held. [1]

Exposure to RF radiation is well-documented to cause Ca $^{2+}$ efflux (Cherry, 2000). Ca $^{2+}$ RF effects have been proposed as a basis for quickly setting initial biologically based RF safety limits (Pall, 2014). RF-stimulated Ca $^{2+}$ efflux could be the mechanism by which radiation from wireless devices caused the hyperthermia reaction. It may also be one of the mechanisms for the development of type 1 diabetes. This would not be the only instance of diabetes being caused by the malfunction of ion channels. Recent research has shown that many cases of neonatal diabetes are caused by genetic differences in K(ATP) channels and that treatment with sulphonylureas can correct those problems in about 90% of the cases sufficiently that no additional insulin is needed (Ashcroft, 2012; McTaggart et al., 2010). RF-promoted Ca $^{2+}$ efflux could have serious implications in medical facilities and hospitals (Pall, 2015). Effects on ion channels can have far-reaching consequences (Ashcroft, 2012). For instance, ion channel effects may cause cardiac arrhythmias experienced by some people upon exposure to 2.4 GHz radiation from cordless phones, documented in two double-blind sham-controlled studies (Havas et al., 2010; Havas and Marrongelle, 2013). WiFi altered cardiac response to epinephrine and dopamine in a placebo-controlled rabbit study (Sailia et al., 2015). Thus, common RF exposures could cause cardiac arrhythmias and alter biological responses to standard therapies in life-threatening ways.

Changes in the molecular shape of the insulin molecule result in altered insulin action, e.g. humalog. RF radiation has been shown to induce conformational changes in proteins and protein expression (Cherry, 2000; Yakymenko et al., 2015). RF-induced conformational changes in insulin, insulin receptors, or glucose transport proteins may be mechanisms by which RF blocks the action of insulin within the body. Receptor expression may also be affected. RF radiation is well-documented to cause oxidative stress, which has important pathogenic potential and may be a primary mechanism in causing biological effects, including interference with insulin action (Yakymenko et al., 2015). RF exposure from "dirty" electricity and wireless radiation may be one cause of hospital-related hyperglycemia.

Global standards for RF radiation and EMF exposures are so outdated that 220 RF/EMF researchers have appealed to the UN and the WHO to take action (EMF Scientist, 2015). A Harvard report showing that the FCC is so industry dominated that it cannot adequately protect the public has particular relevance for medicine where the adoption of new wireless technology has been rapid in recent years and, as this case report shows, may be detrimental to many individuals (Alster, 2015).

Conclusions

The events reported have serious implications for the use of wireless technology and necessitates reevaluation of its near-ubiquitous presence, especially in medical facilities and hospitals. The effects – elevated blood glucose, hyperthermia and cardiac arrhythmia – are

[1]RF measurements made using HFE-35C by GigaHertz Solutions. Ambient levels measured using the UBB27_G3 Antenna, which measures levels of RF radiation from 360 degrees. Spot measures made during shielding using the LogPer-Antenna, a directional antenna.

serious and warrant immediate action to protect patients. Hospitals and medical facilities should minimize their patients' RF exposures from "dirty" electricity and wireless technology, returning to the use of dedicated cabled communication systems.

A statement buried deep in ICNIRP's own article supports this approach:

> Different groups in a population may have differences in their ability to tolerate a particular NIR (non-ionizing radiation) exposure. For example, children, the elderly, and some chronically ill people might have a lower tolerance for one or more forms of NIR exposure than the rest of the population. Under such circumstances, it may be useful or necessary to develop separate guideline levels for different groups within the general population, but it may be more effective to adjust the guidelines for the general population to include such groups.
>
> (ICNIRP, 2002)

Declaration of interest

The author reports no conflicts of interest. The author alone is responsible for the content and writing of this article.

References

Alster, N. (2015). *Captured Agency: How the Federal Communications Commission Is Dominated by the Industries It Presumably Regulates*. Harvard University's Edmond J. Safra Center for Ethics. Cambridge, MA: Harvard University.

Ashcroft, F. M. (2012). *The Spark of Life*. London, UK: Penguin. ISBN: 9781846143014.

Belyaev, I. (2012). Evidence for disruption by modulation: role of physical and biological variables in bioeffects of non-thermal microwaves for reproducibility, cancer risk and safety standards. In: Sage, C., Carptenter D. *BioInitiative Report: A Rationale for a Biologically-based Public Exposure Standard for Electromagnetic Radiation*. BioInitiative Working Group, at www.bioinitiative.org, December 31, 2012. (Section 15).

Cherry, N. (2000). Criticism of the health assessment in the ICNIRP guidelines for RF and microwave radiation (100 kHz- 300 GHz).Retrieved from http://www.electricalpollution.com/documents/Cherry2000EMR_ICNIRP_critique_09-02.pdf

Dodge, C. (1969). Clinical and hygienic aspects of exposure to electromagnetic fields. Biological effects and health implications of microwave radiation. *Symposium Proceedings*, Richmond, Virginia, September 17–19.

EMF Scientist. (2015). International scientists appeal to U.N. to protect humans and wildlife from electromagnetic fields and wireless technology. Available from: http://www.EMFscientist.org

Gale, E. A. M. (2002). The rise of childhood type 1 diabetes in the 20th century. *Diabetes* 51:3353–3361.

Graham, M. (2002). Mitigation of electrical pollution in the home, Memorandum No. UCB/ERL M02/8, 19 April, Electronics Research Laboratory, College of Engineering, University of California, Berkeley 94720

Hankin, N. (2002). Center for Science and Risk Assessment, Radiation Protection Division, EPA, correspondence regarding the limitations and purpose of the FCC exposure standards. Available from: http://www.emrpolicy.org/litigation/case_law/docs/noi_epa_response.pdf

Havas, M. (2006). Electromagnetic hypersensitivity: Biological effects of dirty electricity with emphasis on diabetes and multiple sclerosis. *Electromagn. Biol. Med*. 25:259–268.

Havas, M. (2008). Dirty electricity elevates blood sugar among electrically sensitive diabetics and may explain brittle diabetes. *Electromagn. Biol. Med*. 27:135–146.

Havas, M., Marrongelle, J. (2013). Replication of heart rate variability provocation study with 2.4 GHz cordless phone confirms original findings. *Electromagn. Biol. Med*. 32 (2):253–266. doi: 10.3109/15368378.2013.776437.

Havas, M., Marrongelle, J., Pollner, B., et al. (2010). Provocation study using heart rate variability shows microwave radiation from 204 GHz cordless phone affects autonomic nervous system. *Eur. J. Oncol. Lib*. 5:273–300.

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans. (2013). Non-ionizing radiation, part 2: Radiofrequency electromagnetic fields.102. Available from: http://monographs.iarc.fr/ENG/Monographs/vol102/mono102.pdf

ICNIRP Statement. (2002). General approach to protection against non-ionizing radiation protection. *Health Phys*. 82:540–548.

Meo, S. A., Alsubaie, Y., Almubarak, Z., et al. (2015). Association of exposure to radio-frequency electromagnetic field radiation (RF-EMFR) generated by mobile phone base stations with glycated hemoglobin (HbA1c) and risk of type 2 diabetes mellitus. *Int. J. Environ. Res. Public Health*. 12:14519–14528.

McTaggart, J. S., Clark, R. H., Ashcroft, F. M. (2010). The role of the KATP channel in glucose homeostasis in health and disease: more than meets the islet. *J Physiol*. 588:3201–3209.

Milham, S. (2010). Historical evidence that electrification caused the 20th century epidemic of 'diseases of civilization. *Med. Hypotheses* 74:337–345.

NTP. (2016). Report of partial findings from the national toxicology program carcinogenesis studies of cell phone radiofrequency radiation in Hsd: Sprague Dawley® SD rats (Whole Body Exposures) bioRxiv preprint first posted online May. 26, 2016. Available from: https://dx.doi.org/10.1101/055699

Pall, M. (2014). Microwave electromagnetic fields act by activating voltage-gated calcium channels: Why the current international safety standards do not predict biological hazard. *Recent Res. Devel. Mol. Cell. Biol*. 7.

Pall, M. L. (2015). Scientific evidence contradicts findings and assumptions of Canadian Safety Panel 6: microwaves act through voltage-gated calcium channel activation to induce biological impacts at non-thermal levels, supporting a paradigm shift for microwave/lower frequency electromagnetic field action. *Rev Environ Health* 30(2):99–116.

Sage, C., Carptenter, D., ed. (2012). BioInitiative report: A rationale for a biologically-based public exposure standard for electromagnetic radiation. (Conclusions) BioInitiative Working Group, Available from: www.bioinitiative.org (accessed 31 Dec 2012).

Sailia, L., Hanini, A., Smirani, C., et al. (2015). Effects of acute exposure to WIFI signals (2.45 GHz) on heart variability and blood pressure in Albinos rabbit. *Environ. Toxicol. Pharmacol*. 40:600–605.

Taylor, W. (2014). U.S. Department of Interior, Willie Taylor, Director of the Office of Environmental Policy and Compliance, Comment on National Telecommunications and Information Administration plans for FirstNet, Feb 7, 2014, ER 14/0001 and ER 14/0004. Available from: http://www.ntia.doc.gov/files/ntia/us_doi_comments.pdf

Wyde, M. (2016) The U.S. NTP study: A real game changer or just another study? *BioElectroMagnetic Society Conference*, June 8, 2016.

Yakymenko, I., Tsybulin, O., Sidorik, E., et al. (2015). Oxidative mechanisms of biological activity of low-intensity radiofrequency radiation. *Electromagn. Biol. Med*. 7:1–16.

Exhibit F

From: Webmaster <webmaster@electricalpollution.com>
Subject: **Comments for December 6 meeting**
Date: December 6, 2016 2:48:09 PM CST
To: livequestions@fcc.gov
Bcc: Dafna Tachover <dtachover@gmail.com>
▶ 11 Attachments, 3.0 MB

Dear FCC Disability Advisory Committee-

It is essential that the FCC Disability Advisory Committee be involved in evaluating the impact of all FCC actions on individuals experiencing environmentally-induced functional impairment from wireless technology. I have participated in numerous FCC dockets and have continually brought up the need for the FCC to stop promoting a technology that is both dangerous and exclusionary.

I received word of this meeting on very short notice. I hope you will extend the time you are allotting for comments on the need for accommodation of people who experience serious functional impairment when exposed to radiation from wireless technology. We have participated an numerous other FCC dockets. You should arrange that that information gets forwarded to you as it comes in, so you can take appropriate action in a timely manner.

I am attaching comments my husband and I submitted to the FCC regarding 5G and and landline abandonment and the effect on us and others like us. I am also attaching the comment I made to NIDILRR about steps needed to make society more inclusive. Most are areas that the FCC has responsibility and therefore should take action.

There is a lot the FCC could and should do to make society totally inclusive instead of promoting technologies that cause public health problems and act as barriers to participation for a large segment of society.

Sincerely,
Catherine Kleiber

CenturyLink….pdf (98.7 KB) CenturyLink….pdf (192 KB)

NIDILRRCath….pdf (195 KB) FCCNoiseCar….pdf (174 KB) FCCNoiseCat….pdf (887 KB) Sanitary_Norms.pdf (54.3 KB)

UtilityDebunk.pdf (85.3 KB) Report on Ex….pdf (421 KB)

FCC5GCathS….pdf (737 KB) FCC5GDanSe…df (86.8 KB) WirelessViol….pdf (117 KB)

Protecting my health and that of others by using a hardwired computer in a low RF environment. For more information, see www.electricalpollution.com

Exhibit F

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of:

	)	
	)	
CenturyLink	)	
SECTION 214 APPLICATION TO	)	**WC Docket No(s). 16-383**
DISCONTINUE DOMESTIC NON-DOMINANT	)	**Comp. Pol. File No. 1362**
CARRIER TELECOMMUNICATIONS SERVICES	)	
	)	
	)	

To: Office of the Secretary
Federal Communications Commission
Washington, DC 20554

Reply Filed by: **Catherine Kleiber**
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November 29, 2016

Dear Sir or Madam,

I am writing to request that you open a supplemental Notice of Proposed Rule Making (NPRM) on radiofrequency sickness as it relates to decisions to abandoning the copper landline telephone infrastructure. Radiofrequency (RF) sickness is a functional impairment caused by overexposure to radiofrequencies, which includes the microwave frequencies used in wireless communication and high frequency signals on electrical wiring, also known as "dirty" electricity or electrical pollution.[1,2,3,4] Once one has radiofrequency sickness, exposure to radiofrequencies causes functional impairments which can range from uncomfortable to life-threatening.

In a recent letter, the United States Department of the Interior states that "the electromagnetic radiation standards used by the Federal Communications Commission (FCC) continue to be based on thermal heating, a criterion now nearly 30 years out of date and inapplicable today" (http://www.ntia.doc.gov/files/ntia/us_doi_comments.pdf) No one should be forced off of a safe landline phone and onto a cellphone which emits radiation that has significant biological effects, including cancer, and meets no meaningful safety limits, as stated above. The CenturyLink proposal would ultimately **force** people in rural areas to use cellphones and therefore should be denied. Use of wireless technology should be discouraged, not encouraged because additional use means an increase in unavoidable radiation emissions from antenna installations, resulting in increased health risks for surrounding citizens and increased environmental damage (http://www.youtube.com/watch?v=wARxnaxrRKk). "Public safety standards are 1,000 – 10,000 or more times higher than levels now commonly reported in mobile phone base station studies to cause bioeffects."(http://www.bioinitiative.org/conclusions/). Furthermore, even the FCC's outdated limits are not being enforced see this press release from the EMR Policy Institute (http://www.marketwire.com/press-release/-1770139.htm) and this video about antenna sites exceeding allowable transmissions (http://www.youtube.com/watch?v=8oICZOtMwPo&list=UUswusUtfIemZ1TqGtspPstA&index=3).

Undoubtedly, CenturyLink says they have to transition away from copper line phones because too many people have already moved away from them. However, based on my in-law's experience, this is often a problem telecom companies' own making because they have essentially neglected their copper wires so badly that the phone service has become so crummy and repairs so poor that people are forced to leave landline phones if they want decent service. Does this mean that providers of other essential services can neglect their way into forcing changes? Why has the FCC allowed this to neglect to go on?

I have radiofrequency sickness. I become ill in environments polluted by radiofrequency signals of both transmitted and electrical origin. It is important that the FCC promulgate rules related telephone service such that people with radiofrequency sickness have telephone options available to them throughout the country that are safe for them, namely landline telephones. Furthermore, the FCC needs to promulgate biologically-based safety standards for design and testing of electronic devices such that they are no longer putting high frequency electrical signals onto building wiring. The presence of high frequency electrical signals can cause functional impairment and limit access for people with radiofrequency sickness to public buildings and community gathering spots and thus violates the Americans with Disabilities Act (ADA), especially the 2008 ADA Amendments.

The proliferation of wireless technology is increasing the number of people with radiofrequency sickness and also restricting the daily activities of people with radiofrequency sickness. Phasing out the copper landline telephones would cause further isolation. **The FCC has extra responsibility under the American's with Disabilities Act (ADA) to keep landline phones even in rural areas because many people with radiofrequency sickness cannot use wireless devices at all.** Elimination of landline phones would leave these people, including ourselves, with no way other than paper mail to communicate with the outside world (see this link to view a video about the cardiac arrhythmias some people get as a result of exposure to wireless devices http://www.youtube.com/watch?v=_EI9fZX4iww). This is a violation of the 2008 ADA Amendments. Many many people with RF sickness have fled to rural areas to escape the proliferation of wireless technology in metropolitan areas and rely on landline telephones for communication.

Courts have interpreted the 2008 ADA Amendments broadly to ensure accessibility throughout society and require broad inclusivity. (http://www.justice.gov/osg/briefs/2003/3mer/2mer/2002-1667.mer.aa.html, http://disabilitylaw.blogspot.com/2012/06/d-mass-allows-ada-title-iii-challenge.html) Thus, telecom companies cannot abandon landlines until they have a technology that provides an equal or better level of access to people with symptoms of RF sickness - estimated at 3-30% of the population and ranging from severely impaired to less severely impaired. People with RF sickness cannot safely use wireless technology or technology which exposes them to RF on wiring.

Telephone companies must be required to provide RF interference-free copper wire telephone service to people with RF sickness. Most people with RF sickness cannot use cellphones. Cable phones and fiber optic phones can come with electronics that emit biologically significant RFI (RF interference - which can be Incidental or Unintentional, but is still biologically active) and are intolerable to some people with RF sickness. Phone companies need to provide RF filters and DSL filters to people with RF sickness without a hassle. Experience has shown that RF cross-contamination between lines (DSL to non-DSL lines) and between phone lines and electrical grid RF can be biologically significant so all lines should be equipped with filters. (From a public health perspective, it would be best if these were provided to all customers as a matter of course. All people experience biological effects from RF exposure, but many are either still compensating well enough they are not symptomatic or they simply do not make the connection between exposure and symptoms.)

No new source of radiation exposure should be allowed without examining the ADA compliance. Many people are now excluded from public buildings, public places, parks, highways, and limited in almost all aspects of normal daily living. Continued rollout of additional sources of RF radiation puts the FCC in direct violation of the ADA. View this video http://www.youtube.com/watch?v=sv1E9IXUd6M to see further discussion about wireless technology and cardiac arrhythmia, including the fact that regular screening for cardiac susceptibility prior to allowing people into WiFi enabled areas (and at least yearly thereafter) would be recommended according to RF exposure protocols. **Should public places really contain an environmental pollutant so dangerous that regular screening would be appropriate to keep people from suffering disabling or fatal consequences? Should people, especially people already suffering from RF induced impairment, be FORCED to rely on such a potentially dangerous medium to communicate?**

Radiofrequency radiation, which includes the radiation emitted by wireless devices, was classified by IARC as a class 2B possible human carcinogen, similar to lead, DDT, and chloroform, in 2011.[5] There are an increasing number of experts stepping forward to say that that classification should be changed to either 2A "probable" carcinogen[6] or even class 1 - carcinogen.[7] Even if the classification is not changed, people should not be forced to use a class 2B carcinogen to communicate. Other governments warn their citizens NOT to use cellphones and to use landlines whenever possible. The only reason wireless is still being pushed is the huge industry-based sales pitch, aided by "cool"-factor induced denial. **The recent release of the U.S. National Toxicology Program findings that RF radiation breaks DNA and causes cancer necessitates the FCC to deny CenturyLink's move to abandon its landline infrastructure.** Additionally, a replicated European study found that RF radiation is a cancer growth promotor (http://ehtrust.org/science/facts-national-toxicology-program-cellphone-rat-cancer-study/). Thus, it is imperative that the landline infrastructure be maintained, not only to comply with the 2008 ADA Amendments and allowing people with RF induced impairment to participate in society, but to give others a safe way to communicate.

Symptoms that occur with RF radiation exposure vary depending on the particular frequencies involved, their amplitude, and the duration of exposure and the size, height, and build of the exposed person. Headache, brain-fog, short-term memory loss, scattered thinking, irritability, nerve pain, muscle weakness, heart palpitations, and appetite loss are common. Longer stays in polluted environments intensify the symptoms.[1]

Wireless technology and polluting electrical technology such as variable speed motors, compact fluorescent light bulbs, dimmer switches, etc. often cause symptoms for people with radiofrequency sickness (Please see www.electricalpollution.com for more information.)

I am not the only one in my family who is affected. My two young sons are also affected. They have lost their appetite and even vomited as a result of being in polluted environments. My older son used to lose behavior control in response to transmitted communications signals. We have observed this effect particularly related to WiFi, transmitting utility meters, and cellphones. Polluted electrical environments evoked a similar response. The change in his behavior was quite dramatic. In unpolluted environments, he was in control of himself, polite, logical, sweet and kind. In short, wonderful. In polluted environments, within a short time he became hyper and if we did not leave he became quite out of control, unable to listen to instructions, and behaving in ways that would normally be atypical. He rarely spends any time in polluted environments now due to the cardiac arrhythmias that result.

My younger son also experienced loss of behavior control. However, his response to transmitting utility meters is even more scary: he suffers from symptomatic cardiac arrhythmia (http://www.magdahavas.com/?s=bradycardia). When he was younger, within a short time, he began to act as though he has a major illness coming on, crying and begging to leave. Within minutes after leaving the polluted environment, he was no longer fussy or crying. This happened at Christmas a several years ago, a time he would not normally want to leave his grandparents home, and has happened at other places and events since. He developed similar arrhythmias in response to the installation of 4G cellphone service in our area. We have been frantically shielding the house since in order to keep him

healthy and have had to limit his time outside for the same reason. The rampant proliferation of wireless technology the FCC has promoted has led to a marked increase in ambient RF radiation levels and has virtually isolated us in our home and farm due to the serious functional impairment it causes us.

Replicated double blind studies show that a cordless phone base station operating at WiFi frequencies can cause cardiac arrhythmias in susceptible individuals.[8,9,10] This short video discusses the cardiac effect that wireless can have- http://www.youtube.com/watch?v=_EI9fZX4iww. See http://www.youtube.com/user/EMRPolicyInstitute for a longer presentation by Prof. Magda Havas in three segments.

Obviously, we should not be forced to use wireless technology, as we would be under a plan like CenturyLink's - since it induces arrhythmia for us and could probably also cause cardiac arrest, a fact Frey proved in frogs years ago.[11]

We are not alone in experiencing very serious effects from exposure to radiation from wireless devices (pulsed microwave radiation). I have spoken with others who are similarly isolated by the proliferation of wireless technology and their own serious reactions to it. "Jumping off the Wireless Bandwagon - Wifi and You" mentions that schoolchildren are also experiencing cardiac symptoms from WiFi, including cardiac arrest. [12]

I am the webmaster of a website about radiofrequency sickness, electrical pollution, and wireless technology. It is www.electricalpollution.com. As webmaster, I have received contacts from many individuals who also have radiofrequency sickness. Exclusion from society by the increasing levels of microwave radiation from wireless technology is a pretty universal experience of persons with radiofrequency sickness. **Most of us rely on landline telephones for communication.**

Wireless technology was NOT safety tested prior to release. Safety is only "proven" by continued industry insistence that the only way wireless technology can have any biological effect is through thermal or tissue heating effects. This is totally untrue. Disconnect by Devra Davis, an epidemiologist, discusses the coverup and research supporting non-thermal biological effects at great length. She also discusses research done years ago demonstrating the ability of pulsed microwave radiation to stop the heart. Cellular Telephone Russian Roulette (http://microondes.files.wordpress.com/2010/03/robert_c_kane_cellular_telephone_russian_roulette.pdf), written by Robert C. Kane, a former Motorola engineer, discusses the fact that numerous studies show that significant biological effects occur at such low levels that useful wireless technology is by definition unsafe wireless technology. He further discusses the problem of microscopic, but biologically harmful hot spots which occur at levels far below those normally considered to cause thermal harm.

There are numerous studies showing that radiation from wireless technology seriously harms a variety of animal species and also plants, impairing reproduction, growth, and navigation.[13, 14, 15] A NEPA evaluation and EIS are necessitated by the presence of three options which have the potential to have radically different impacts [Burkholder v. Peters, 58 F. App'x 94, 96 (6th Cir. 2003) (quoting42 U.S.C. § 4332(2)(C)).] The EIS should include a review of the impact of all options on the environment, as well as on human health and safety. "The Report on Possible Impacts of Communication Towers on Wildlife

Including Birds and Bees" commissioned on 30th August, 2010 by the Ministry of Environment and Forest, Government of India (incorporated by reference herein in its entirety http://www.moef.nic.in/downloads/public-information/final_mobile_towers_report.pdf) and "Impacts of radio-frequency electromagnetic field (RF-EMF) from cell phone towers and wireless devices on biosystem and ecosystem – a review,"" (incorporated by reference herein in its entirety http://www.biolmedonline.com/Articles/Vol4_4_2012/Vol4_4_202-216_BM-8.pdf), Adverse Influence of Radio Frequency Background on Trembling Aspen Seedlings: Preliminary Observations (incorporated by reference herein in its entirety https://www.hindawi.com/journals/ijfr/2010/836278/), Tree damage in the vicinity of mobile phone base stations (incorporated by reference herein in its entirety http://kompetenzinitiative.net/KIT/wp-content/uploads/2016/06/Tree-damages-in-the-vicinity-of-mobile-phone-base-stations.pdf), Radiofrequency radiation injures trees around mobile phone base stations (incorporated by reference herein in its entirety https://www.researchgate.net/publication/306435017_Radiofrequency_radiation_injures_trees_around_mobile_phone_base_stations), The trees make it easy to recognize the effects of RF-EMF. Examples of tree damage (incorporated by reference herein in its entirety http://kompetenzinitiative.net/KIT/wp-content/uploads/2016/09/Trees-in-Bamberg-and-Hallstadt-Documentation-2006-2016.pdf) and the letter from the Department of Interior (incorporated by reference herein in its entirety http://www.ntia.doc.gov/files/ntia/us_doi_comments.pdf) provide enough compelling evidence of potential environmental harm at existing RF limits to necessitate an EIS evaluating the harm done by promoting additional wireless use and installation versus continuing in the status quo versus requiring repair of existing landline telephone infrastructure and pricing of wireless service to discourage frivolous use of wireless technology.

A number of studies show that electromagnetic radiation, including radiofrequency radiation, alters heart rate variability, blood pressure (including inducing hypertension with microwave exposure) and increases risk of arrhythmia related heart disease and heart attack.[1,2,8,9,10]

There is extensive documentation in the literature of alterations of Ca^{2+} homeostasis.[2] This is likely to be responsible at least in part for the profound effects that radiofrequency radiation has on the heart and neurological function. Ca^{2+} regulates gap junction opening. Gap junctions are key in many intercellular communications.

Exposure to radiofrequency radiation also interferes with the action of enzymes, signaling pathways, and makes the immune system simultaneously hyperactive and less effective.[2,16] Immune impairment results in part from the disruptive effect of radiofrequency radiation on calcium ion homeostasis. In addition to radiofrequency radiation-induced immune impairment increasing risk of various types of infection, it is likely to increase the risk of getting cancer from the DNA breakages radiofrequency radiation is well-documented to induce.[17] While radiofrequency radiation is non-ionizing, the metabolic changes it can cause result in oxidative damage to DNA and subsequent breakage. Direct interactions between radiofrequency radiation and DNA can have similar results, as well as causing changes in gene transcription, through changes in electron flows induced by the radiation.[17]

Neurological function can be seriously impaired by radiofrequency radiation. Cholinesterase enzyme activity is impaired by exposure to radiofrequency radiation in a manner similar to impairment caused by organophosphate pesticides, often rendering a person with radiofrequency sickness particularly

sensitive to small amounts of chemicals.[4] Radiofrequency radiation can lower the pain threshold, slow reaction times, cause fatigue, muscle weakness, headaches, difficulty concentrating, short-term memory problems and even memory loss.[1,3,16,17] These may be caused by disruption of Ca^{2+}, disruption of various enzyme pathways, induction of the stress response and associated effects, increased permiability of the blood-brain barrier, or various other effects of over-exposure to radiofrequency radiation.[1,2,4]

Radiofrequency radiation significantly decreases melatonin levels and decreases the ability of existing melatonin to fight cancer.[2]

All these biological effects are good reasons to REMOVE sources of exposure to RF from the environment, built and unbuilt. A review of old Soviet literature discusses the fact that reflexes, including conditioned reflexes, are slower in individuals exposed to RF. They go on to state "It is possible to observe degeneration of the neurons in the cerebral cortex and the basal ganglia, the pons, the medulla oblongata, and in some cases even the cerebellum, as well as histological and chemical changes in the vicinity of nerve fibers."[1] Obviously, it is not a good idea to have an environmental toxin that can impair reflexes and damage nerves in the environment at all. The original purpose of cellphones was to allow communication from anywhere, often inside vehicles. The safe operation of motorized vehicles relies on those very reflexes and good neurological and brain function, therefore all cellphones should be labeled with warnings about their ability to compromise neurological and brain function and warn against having a cellphone operating in a motorized vehicle. **Furthermore, a robust landline phones system should be maintained to minimize the need for people to use cellphones and a pricing structure to deter their frivolous use should be adopted.**

Many more people are adversely affected by RF radiation than realize it. Radiation from wireless devices may exacerbate the effects of a distraction such as conversation and impair reflexes and slow brain processing even at the lower levels phones emit when not connected. This may occur in part due to RF lowering dopamine levels.[20] The findings of "Examining the Impact of Cell Phone Conversations on Driving Using Meta-Analytic Techniques" support this assertion. Specifically, the authors state "There was a similar pattern of results for passenger and remote (cell phone) conversations."[21] The RF emissions impairing the driver's reactions is a likely explanation. "A Comparison of the Cell Phone Driver and the Drunk Driver" also shows delays in reaction times that may relate to the RF emissions from the phone.[22] In light of this, limiting exposure to radiofrequency radiation in vehicles for safety reasons and so that persons with radiofrequency sickness can safely travel and are able to fully exercise their civil rights makes a great deal of sense.

There are long-term public health implications of wireless radiation exposure. Detrimental biological effects, distinct from tissue heating effects, have been extensively documented in studies at a range of different frequencies and at levels below the current United States safety standard.[2] Many other nations already have more rigorous safety standards than does the US. The European Parliament has voted to re-evaluate and reduce levels of exposure to transmitted radio and microwave frequencies due to the public health risk they pose. Microwave and radiofrequency radiation are now being associated with attention deficit disorder, autism, sleep disorders, multiple sclerosis, Alzheimer's disease and epilepsy, as well as asthma, diabetes, malignant melanoma, breast cancer, and other illnesses that have become increasingly more common. Please see www.bioinitiative.org to read a 2012 review of the peer-

reviewed science on the long-term risks of exposure to transmitted microwave and radio frequency radiation. Studies finding no health effects are predominantly industry funded.[23] A report by Hallberg and Johansson[24] published in Pathophysiology asks the provocative question about whether the recent (1997 and later) increase in exposure to microwave frequencies may be responsible for the recent decline in public health in Sweden. The data seem to say that public exposure to microwave frequencies is a likely culprit.

The Soviet Union performed large amounts of research and found biological effects at levels far below our "safety" guidelines, hence their much lower safety limits.[1] Our current safety regulations are not designed to protect people from the non-thermal hazards posed by transmitting meters or other devices. The FCC "safety" standards are solely designed to protect a 6 ft 185 lb man from tissue heating during a short (6 minute) exposure. They are not designed to protect even a 6 ft man from biological effects during a continuous exposure.[25] They are not designed to protect women, children, and smaller men even during short-term exposures and the exposure for the general population would be continuous, so these "safety" standards are meaningless for the population as a whole.[26] Additional studies are now available. Please visit http://www.prlog.org/12245111-everything-you-wanted-to-know-about-cell-phone-radiation.html for links to the numerous comments by experts calling for the FCC to enact modern biologically-based RF safety limits. All projects moving people from safe landline telephones to wireless technologies of any sort should be halted until meaningful safety limits are in place. It violates everyones human rights to do otherwise (see "**Wireless Technology Violates Human Rights**", attached).

Copper line service carries its own power. Neither cell antennas, nor cellphones necessarily do. What of reliability during disasters? This is especially important since smart meters have increased the vulnerability of the electrical grid (http://www.gettingsmarteraboutthesmartgrid.org/, http://electromagnetichealth.org/wp-content/uploads/2014/02/Smart-Grid-Report-3-15-13.pdf). Major outages have increased in the last few years.

Additionally, landlines provide much better 911 service than cellphones. As you can see from reading this story: Why Calling 911 On Your Cell is Not Always a Good Idea (http://www.nbcnews.com/tech/security/why-calling-911-your-cell-not-always-good-idea-n99736). Landline phones can always be found in the same place and can be traced to a specific address, so they are much better for children or even adults living alone and having an emergency to call from. Cellphones often have locks on them for security purposes and that can prevent an emergency call from being made, especially by a child who many not know how to get around it.

High frequency signals on wiring also cause radiofrequency sickness, hence the need for the FCC to enact meaningful health protective standards related to the engineering of electronic technologies, including fiber optic and cable phone and internet. Milham and Morgan found a dose-response relationship between high frequencies present on building wiring and cancer.[27] Removing high frequencies on building wiring has improved MS symptoms, blood sugar levels, asthma, sleep quality, teacher health, headaches, ADD, and numerous other health problems.[28,29,30] Technical papers provide a solid electrical and biomolecular basis for these effects. A recent paper by Ozen showed that transients induce much stronger current density levels in the human body than does the powerline 60Hz signal.[31]

Another technical paper discusses the authors' findings that high frequency communication signals on power lines also induce much stronger electrical currents in the human body than a low frequency signal of the same strength.[32] The induced currents disturb normal intercellular communications. This causes harmful short-term and long-term effects. The effects seem to be the same whether the system is AC or DC since the most biologically active component is the "noise" from poorly engineered devices.

Electrical engineering and biological sciences are largely separate disciplines. Biologists, molecular biologists, and doctors have been largely unaware of the high frequency pollution of electrical systems (AC and DC). The assumption, until recently, by biologists was that AC and DC systems were "clean". This is not so and has not been so for many many years. This has been well known by electrical engineers, but they have been taught that from a biological standpoint it is insignificant, after all the pollution, even in extreme cases, usually does not amount to much more than a couple of volts and in many cases is measured in millivolts. However, the assumption of safety is proving not to be true.[27,28,29,30,31,32] This shows the importance of establishing engineering standards for electronic devices that protect from biological effects. If proper standards are established, and the above mentioned references offer a good basis for establishing initial standards, non-polluting electronics and electrical components that do not emit RFI can be engineered. This would benefit everyone in the long run and decrease the isolation of people with radiofrequency sickness.

At present there are no FCC standards for conducted RF above 30 MHz. This is a serious oversight since consumer and utility transmitting devices could easily pollute the wiring with communication frequencies a levels detrimental to human health. This has already been documented in reference to a transmitting electrical meter (incorporated herein by reference "Report on Examination of Selected Sources of Electromagnetic Fields at Selected Residences in Hastings-on-Hudson" - Isotrope Wireless http://stopsmartmetersny.org/images/Report_on_Examination_of_Selected_Sources_of_Electromagnetic_Fields_at_Selected_Residences_20140301.pdf).

Our experience, and that of others, strongly suggests that the proliferation of wireless technology and electrically polluting electrical technology is a serious public health threat that is likely to be behind many of the rapidly increasing public health problems such as multiple sclerosis, fibromyalgia, chronic fatigue syndrome, diabetes, asthma, allergies, migraines, ADD/ADHD, sleep disorders, etc. The FCC has a duty to the public to protect the public health and safety from harm from radiofrequency radiation. (H.R. Report No. 104-204, p. 94) that trumps its duty to promote wireless technology. Please publicly acknowledge the inadequacy of the current thermally-based FCC guidelines and halt any projects which would promote wireless technology until biologically meaningful RF radiation limits are enacted.

FCC does not possess the expertise to set biologically-based radiofrequency radiation safety limits. The Environmental Protection Agency (EPA) does. Therefore, the FCC should advocate for Congress to direct the EPA to establish biologically-based radiofrequency radiation safety limits and provide the budget and resources to carry out that task. 2012 HR6358 was an excellent example of legislation to authorize the EPA to establish biologically-based radiofrequency radiation safety limits.

Over 200 EMF/RF researchers from around the world have appealed to the U.N. to take action because safety limits related to EMF/RF exposures, including wireless are inadequate and outdated (http://www.EMFscientist.org). They are concerned about the public health and environmental implications of the rampant proliferation of wireless technology since biological effects are well-documented at levels below FCC RF limits.

In short, wireless technology and polluting electrical technology are unsafe and access-limiting. Elimination of landline telephones would further marginalize people with radiofrequency sickness in violation of the American's with Disabilities Act and endanger the public health and environment. Please protect the health and rights of the citizens of this great country by denying CenturyLink's request to abandon their landline phone system. **To protect public health, a robust landline phone system should be maintained to minimize the need for people to use cellphones and a pricing structure to deter their frivolous use should also be adopted.** Please open NPRMs specifically in order to promulgate FCC rules related to protecting the civil rights of people with radiofrequency sickness, as guaranteed under the ADA and 2008 ADA Amendments, and to re-work engineering rules for electronic devices so that they provide meaningful protection for human health and prevent electronic devices from polluting the landline phone system and the electrical grid with RF and from emitting biologically-active RFI.

Thank you.

Sincerely,

Catherine Kleiber

References:

1. Marha K, Musil J, and Tuha H. Electromagnetic Fields and the Life Environment. Institute of Industrial Hygiene and Occupational Diseases, Prague, Czechoslovakia. English Translation 1971

2. Cherry, N. 2000 Criticism of the Health Assessment in the ICNIRP Guidelines for Radiofrequency and Microwave Radiation (100 kHz- 300 GHz)

3. Johnson Liakouris AG. Radiofrequency (RF) sickness in the Lilienfeld study: An effect of modulated microwaves Archives of Environmental Health; May/Jun 1998; 53, 3.

4. Grant L. Microwaves Imitate Pesticides. U.S. Department of Energy Risk Management Quarterly, Volume 5-3M.

5. IARC CLASSIFIES RADIOFREQUENCY ELECTROMAGNETIC FIELDS AS POSSIBLY CARCINOGENIC TO HUMANS PRESS RELEASE N° 208 http://www.iarc.fr/en/media-centre/pr/2011/pdfs/pr208_E.pdf

6. Devra Lee Davis, Santosh Kesari, Colin L. Soskolne, Anthony B. Miller, Yael Stein. "Swedish Review Strengthens Grounds for Concluding That Radiation from Cellular and Cordless Phones Is a Probable Human Carcinogen;" *Pathophysiology* - April 2013 (Vol. 20, Issue 2), Pages 123-129.http://www.pathophysiologyjournal.com/article/S0928-4680(13)00003-5/abstract

7. Hardell and Carlberg. "Using the Hill Viewpoints from 1965 for Evaluating Strengths of Evidence of the Risk for Brain Tumors Associated with Use of Mobile and Cordless Phones," *Reviews on Environmental Health*, Volume 28 (November 2013), Issue 2-3, Pages 97–106, http://dx.doi.org/10.1515/reveh-2013-0006 .

8. Havas, J. Marrongelle, B. Pollner, E. Kelley, C.R.G. Rees, L. Tully. Provocation study using heart rate variability shows microwave radiation from DECT phone affects autonomic nervous system. Eur. J. Oncol. Library, vol. 5, 2010 http://www.magdahavas.com/wordpress/wp-content/uploads/2012/01/Havas-HRV-Ramazzini.pdf

9. M Havas and J Marrongelle. Replication of Heart Rate Variability Provocation Study with 2.4 GHz Cordless Phone Confirms Original Findings Electromagn Biol Med. 2013 Jun;32(2):253-66. doi: 10.3109/15368378.2013.776437. http://www.ncbi.nlm.nih.gov/pubmed/23675629#

10. M Havas. Radiation from wireless technology affects the blood, the heart, and the autonomic nervous system Rev Environ Health 2013; 28(2-3): 75–84

11. A.I. Frey and E.S. Eichert. MODIFICATION OF HEART FUNCTION WITH LOW INTENSITY ELECTROMAGNETIC ENERGY. JOURNAL OF BIOELECTRICITY 5(2), 201-210 (1986)

12. Nelson J. Jumping off the Wireless Bandwagon - Wifi and You. Watershed Sentinel. Jan/Feb 2011. http://www.watershedsentinel.ca/content/jumping-wireless-bandwagon-wifi-and-you

13. "*Impacts of radio-frequency electromagnetic field (RF-EMF) from cell phone towers and wireless devices on biosystem and ecosystem – a review*" (http://www.biolmedonline.com/Articles/Vol4_4_2012/Vol4_4_202-216_BM-8.pdf)

14. "*Report on Possible Impacts of Communication Towers on Wildlife Including Birds and Bees*" (http://www.moef.nic.in/downloads/public-information/final_mobile_towers_report.pdf)

15. Warnke U. BEES, BIRDS AND MANKIND: Destroying nature by "electrosmog"

16. Johansson O. Disturbance of the immune system by electromagnetic fields—A potentially underlying cause for cellular damage and tissue repair reduction which could lead to disease and impairment, Pathophysiology, Volume 16, Issues 2-3, August 2009, Pages 157-177.

17. Blank M and Goodman R. Electromagnetic Fields May Act Directly on DNA, Journal of Cellular Biochemistry 75:369-374 (1999)

18. Santini R, Santini P, Le Ruz P, Danze JM, and Seignel M. 2003 Survey Study of People Living in the Vicinity of Cellular Phone Base Stations. Electromagnetic Biology and Medicine Vol. 22, No. 1, pp. 4149.

19. Hyland GJ. Physics and biology of mobile telephony. The Lancet, Vol 356, November 25, 2000.

20. Klaus Buchner and Horst Eger. Changes of Clinically Important Neurotransmitters under the Influence of Modulated RF Fields␣A Long-term Study under Real-life Conditions Original study in German: BUCHNER K, EGER H (2011) Umwelt-Medizin-Gesellschaft 24(1): 44-57. http://www.radiationresearch.org/images/RRT_articles/Buchner%20Eger%20Rimbach%20Study%202011%20ENG%20FINAL%20Revised%2029%20July%202011.pdf

21. "Examining the Impact of Cell Phone Conversations on Driving Using Meta-Analytic Techniques" (http://

hfs.sagepub.com/content/48/1/196.abstract)

22. "A Comparison of the Cell Phone Driver and the Drunk Driver" http://www.distraction.gov/download/research-pdf/Comparison-of-CellPhone-Driver-Drunk-Driver.pdf

23. Huss et al., "Source of Funding and Results of Studies of Health Effects of Mobile Phone Use: Systematic Review of Experimental Studies", Environmental Health Perspectives, 115(1): 1-4, 2007. http://www.ehponline.org/members/2006/9149/9149.pdf.

24. Hallberg O, Johansson O, Apparent decreases in Swedish public health indicators after 1997 – Are they due to improved diagnostics or to environmental factors? Pathophysiology Volume 16, Issue 1, June 2009, Pages 43-46.

25. A letter from Norbert Hankin, Center for Science and Risk Assessment, Radiation Protection Division, EPA, regarding the limitations and purpose of the FCC exposure standards. http://www.emrpolicy.org/litigation/case_law/docs/noi_epa_response.pdf

26. Identification of Research Needs Relating to Potential Biological or Adverse Health Effects of Wireless Communication, 2008, National Academy of Science.

27. Milham S, Morgan L. A new electromagnetic exposure metric: High frequency voltage transients associated with increased cancer incidence in teachers in a California school, American Journal of Industrial Medicine, Volume 51, Issue 8, Date: August 2008, Pages: 579-586

28. Havas M, Olstad A. Power quality affects teacher wellbeing and student behavior in three Minnesota Schools, Science of the Total Environment, Volume 402, Issues 2-3, 1 September 2008, pp. 157-162.

29. Havas M. 2008. Dirty Electricity Elevates Blood Sugar Among Electrically Sensitive Diabetics and May Explain Brittle Diabetes. Electromagnetic Biology and Medicine, 27:135-146. http://www.informaworld.com/smpp/content~db=all?content=10.1080/15368370802072075

30. Havas M. 2006. Electromagnetic hypersensitivity: biological effects of dirty electricity with emphasis on diabetes and multiple sclerosis. Electromagnetic Biology Medicine 25(4):259-68.

31. Ozen, S. 2007. Low-frequency Transient Electric and Magnetic Fields Coupling to Child Body, Radiation Protection Dosimetry (2007), pp. 1–6. http://rpd.oxfordjournals.org/cgi/content/full/ncm315

32. Vignati, M. and L. Giuliani, 1997. Radiofrequency exposure near high-voltage lines. Environ Health Perspect 105(Suppl 6):1569-1573 (1997) http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1469914

Exhibit F

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of:

CenturyLink	)	
SECTION 214 APPLICATION TO	)	**WC Docket No(s). 16-383**
DISCONTINUE DOMESTIC NON-DOMINANT	)	**Comp. Pol. File No. 1362**
CARRIER TELECOMMUNICATIONS SERVICES	)	

To: Office of the Secretary
Federal Communications Commission
Washington, DC 20554

Comment Filed by: **Dan Kleiber**
N9387 Riverview Dr.
Waterloo, WI 53594
(920) 478-9696
kleiber@gdinet.com

November 29, 2016

Dear Sir or Madam,

I am writing to urge you to deny CenturyLink's request to abandon its landline phone system. Please promulgate Notices of Proposed Rule Making (NPRM) with the aim of protecting the civil rights of people with radiofrequency sickness and tightening engineering standards for electronic devices to protect human health from the "dirty" electricity they produce.

Please deny the CenturyLink's request to abandon their landline phone system.

The wireless technology that CenturyLink proposes to replace many landline phones with has been found by the U.S. NTP to break DNA and cause cancer. A replicated European study has found that radiation from wireless technology acts as a cancer promotor (http://ehtrust.org/science/facts-national-toxicology-program-cellphone-rat-cancer-study/). Radiofrequency radiation, emitted by wireless technology, is classified as a class 2B possible carcinogen by the World Health Organization and only complies with completely outdated thermally-based "safety" limits. It should not be forced on ANY telephone customers. Use should be discouraged, not encouraged, because additional use means an increase in unavoidable radiation emissions from antenna installations, resulting in increased health risks for surrounding citizens and increased environmental damage (http://www.youtube.com/watch?v=wARxnaxrRKk). Some experts from the IARC panel think the classification should be changed to probable carcinogen or even carcinogen.

Transmitted radiofrequency radiation (rf) from any source negatively affects my health and that of my family. I am a type I, insulin-dependent diabetic. As such, I test my blood sugar many times per day. I have noticed that rf causes my blood sugar to increase in dangerous ways. On a week-long vacation to visit family, a wireless router caused my blood sugar to become very high. No matter how much insulin I used, I could not get my blood sugar to return to normal, acceptable levels. We ended up cutting our vacation short in order to bring my blood sugar back to normal. Later, we figured out what had happened. The owner of the router (a Microsoft Broadband Networking Wireless Base Station MN-700) was kind enough to turn it off during our next visit and my blood sugar was fine, until the morning we were leaving when it went up. When I checked, the router had recently been turned on.

One afternoon, a neighbor rode with me in my combine while I was harvesting corn. He had his cellular telephone turned on in his pocket. Shortly after he joined me, my blood sugar began to increase. I took some insulin to try to bring it back down, but to no avail. So I tried again. And again. Still without success. Later that afternoon, my neighbor left, taking his cellular telephone with him. My blood sugar immediately dropped to dangerously low levels once I was no longer exposed to the rf from the cellular telephone. Again, I didn't figure out what had happened until I had time to think later. This was one of the first times I was exposed to a cellphone in close proximity for several hours in a row. Now, in similar situations I ask that the phone be turned off.

My experiences with the router and cellphone show how rf affects me. In both situations, I was able to address the issue by asking that the devices be turned off. However, I do not have that option if I am forced to use a wireless device to communicate.

I recently had a new and very scary reaction. While at a federal office for an essential appointment, I was forced into close proximity to two functional smart phones and a WiFiing computer. I went into the office feeling fine with a normal blood sugar and came out with a very high blood sugar, a very elevated body temperature of 101 degrees Farenheit, and feeling awful. It took two days for my blood sugar and body temperature to return to normal and about a week to feel well. Radiofrequency radiation has been shown to cause calcium ion efflux (http://www.electricalpollution.com/documents/Pallmicrow-vgccnoheat.pdf). Inappropriate calcium efflux is known to cause a condition called malignant hyperthermia which can be fatal and is usually caused by certain anesthetics. Fortunately for me, the reaction stopped accelerating when I returned to our shielded house and then crawled into our shielded bed. It could easily be a fatal reaction for someone who did not realize what was happening.

The rapidly increasing rf radiation levels is impacting our ability to earn a living. I used to vend at farmers markets in Madison, Wisconsin and I am no longer able to do so due to the rising ambient rf radiation levels causing serious neurological symptoms suggestive of incipient ALS. The symptoms disappeared at the end of market season when I was able to spend time at my shielded home in much lower ambient rf radiation levels. (The levels outside our home are hundreds to thousands of times lower than ambient Madison levels. Even so, I can tell the improvement in my health when I am inside my shielded home where the levels are a third to a tenth the ambient outside levels and peaks are reduced by over half.) ALS is a progressive fatal neurological disorder whose incidence is increasing (https://wwwn.cdc.gov/als/Download/Neurol%20Clin_ALS_Risk_Factors_2015.pdf). ALS is being linked to factors including oxidative damage (positively linked to smoking which causes oxidative damage), EMF exposure, and military service which would entail high levels of rf radiation exposure. Radiofrequency radiation has been shown to cause oxidative damage (http://www.ncbi.nlm.nih.gov/pubmed/26151230). If my experience is any indicator, the FCC is directly responsible for those deaths by promoting a dangerous technology in complete disregard of the science and the scientists who are calling for biologically-based population-protective RFR safety limits. This willful disregard of the consequences is a violation of our human rights and the Nuremberg Code of Ethics, please read "Wireless Technology Violates Human Rights," attached and at http://www.electricalpollution.com/documents/WirelessViolatesHumanRights2016.pdf

Other sources of rf also cause my blood sugar to increase. Dimmer switches, compact fluorescent lights, and variable speed motors all generate rf. Recently, the rise of wireless technology has greatly increased the incidence of rf. WiFi and cellphones make it difficult for me to conduct business or to travel. Forcing me to use a cellphone or electrically polluting technology to communicate could easily cause serious potentially life-threatening functional impairment for me and violate my rights under the ADA.

Copper line service carries its own power. Neither cell antennas nor cellphones necessarily do. What of reliability during disasters? This is especially important since smart meters have increased the vulnerability of the electrical grid (http://www.gettingsmarteraboutthesmartgrid.org/, http://electromagnetichealth.org/wp-content/uploads/2014/02/Smart-Grid-Report-3-15-13.pdf). Major outages have increased in the last few years. Furthermore, cellphones do not perform as well in many emergency situations, making prompt emergency response difficult, potentially costing lives.

No one should be forced to switch from the tried and true safety of landlines to a potentially hazardous technology compliant only with outdated safety limits. In a recent letter, the United States Department of the Interior states that "the electromagnetic radiation standards used by the Federal Communications Commission (FCC) continue to be based on thermal heating, a criterion now nearly 30 years out of date and inapplicable today" (http://www.ntia.doc.gov/files/ntia/us_doi_comments.pdf. Any projects moving telephone service from landlines to wireless technology should be placed on hold until the FCC Docket (ET docket 13-84) looking at the outdated FCC rf limits reaches completion.

There are numerous studies showing that radiation from wireless technology seriously harms a variety of animal species and also plants, impairing reproduction, growth, and navigation.[12, 13, 14] A NEPA evaluation and EIS are necessitated by the presence of three options which have the potential to have radically different impacts [Burkholder v. Peters, 58 F. App'x 94, 96 (6th Cir. 2003) (quoting42 U.S.C. § 4332(2)(C)).] The EIS should include a review of the impact of all options on the environment, as well as on human health and safety. "The Report on Possible Impacts of Communication Towers on Wildlife Including Birds and Bees" commissioned on 30th August, 2010 by the Ministry of Environment and Forest, Government of India (incorporated by reference herein in its entirety http://www.moef.nic.in/downloads/public-information/final_mobile_towers_report.pdf) and "Impacts of radio-frequency electromagnetic field (RF-EMF) from cell phone towers and wireless devices on biosystem and ecosystem – a review,"" (incorporated by reference herein in its entirety http://www.biolmedonline.com/Articles/Vol4_4_2012/Vol4_4_202-216_BM-8.pdf), Adverse Influence of Radio Frequency Background on Trembling Aspen Seedlings: Preliminary Observations (incorporated by reference herein in its entirety https://www.hindawi.com/journals/ijfr/2010/836278/), Tree damage in the vicinity of mobile phone base stations (incorporated by reference herein in its entirety http://kompetenzinitiative.net/KIT/wp-content/uploads/2016/06/Tree-damages-in-the-vicinity-of-mobile-phone-base-stations.pdf), Radiofrequency radiation injures trees around mobile phone base stations (incorporated by reference herein in its entirety https://www.researchgate.net/publication/306435017_Radiofrequency_radiation_injures_trees_around_mobile_phone_base_stations), The trees make it easy to recognize the effects of RF-EMF. Examples of tree damage (incorporated by reference herein in its entirety http://kompetenzinitiative.net/KIT/wp-content/uploads/2016/09/Trees-in-Bamberg-and-Hallstadt-Documentation-2006-2016.pdf) and the letter from the Department of Interior (incorporated by reference herein in its entirety http://www.ntia.doc.gov/files/ntia/us_doi_comments.pdf) provide enough compelling evidence of potential environmental harm at existing rf limits to necessitate an EIS evaluating the harm done by promoting additional wireless use and installation versus continuing in the status quo versus requiring repair of existing landline telephone infrastructure and pricing of wireless service to discourage frivolous use of wireless technology.

Abandoning copper landline phones will leave many people with radiofrequency sickness, electromagnetic hypersensitivity, etc. cut off from the world. Therefore, abandoning landlines is not in compliance with the ADA (Americans with Disabilities Act), particularly the 2008 ADA Amendments, which base their disability determination on interference with bodily functions (http://www.govtrack.us/congress/bills/110/s3406/text). There are many, many studies which corroborate my experience and show that rf radiation interferes with bodily processes, often seriously (www.bioinitiative.org).

Courts have interpreted the ADA and the 2008 ADA Amendments broadly to ensure accessibility throughout society and require broad inclusivity. (http://www.justice.gov/osg/briefs/2003/3mer/2mer/2002-1667.mer.aa.html, http://disabilitylaw.blogspot.com/2012/06/d-mass-allows-ada-title-iii-challenge.html) Thus, telecom companies cannot abandon landlines until they have a technology that provides an equal or better level of access to people with symptoms of rf sickness - estimated at 3-30% of the population and ranging from severely impaired to less severely impaired. People with rf sickness or functional impairments induced by rf exposure cannot safely use wireless technology or technology which exposes them to rf on wiring.

No new source of radiation exposure should be allowed without examining the ADA compliance. Many people are now excluded from public buildings, public places, parks, highways, and limited in almost all aspects of normal daily living. Continued rollout of additional sources of rf radiation puts the FCC in direct violation of the ADA. "Public safety standards are 1,000 – 10,000 or more times higher than levels now commonly reported in mobile phone base station studies to cause bioeffects."(http://www.bioinitiative.org/conclusions/)

The FCC has a duty to the public to protect the public health and safety from harm from radiofrequency radiation. (H.R. Report No. 104-204, p. 94) FCC does not possess the expertise to set biologically-based radiofrequency radiation safety limits. The Environmental Protection Agency (EPA) does. Therefore, the FCC should advocate for Congress to direct the EPA to establish biologically-based radiofrequency radiation safety limits and provide the budget and resources to carry out that task. 2012 HR6358 was an excellent example of legislation to authorize the EPA to establish biologically-based radiofrequency radiation safety limits

For safety reasons, the FCC must deny CenturyLink's request to abandon landlines and should instead be opening supplemental NPRMs. One NPRM should develop rules to protect the civil rights of people with rf sickness and people who experience functional impairment with exposure to rf. A second NPRM should develop engineering standards that protect human health from rf on wiring from which it both radiates and capacitively couples to people in the vicinity.

Sincerely,

Dan Kleiber

Exhibit F

Public Comment - NIDILRR

Catherine Kleiber
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[National Institute on Disability, Independent Living and Rehabilitation Research (NIDILRR)]

Public Listening Session Comment November 18, 2016

My name is Catherine Kleiber. I have radiofrequency sickness, an environmentally-induced functional impairment caused by exposure to radiofrequencies, from either wireless technology or "dirty" electricity. I am addressing you today to highlight the need to again make public places and buildings accessible for people with radiofrequency sickness.

I experience many symptoms, including cardiac arrhythmias, cognitive difficulties, memory problems, headaches, and fatigue when I am around radiation from wireless technology. The presence of wireless internet and wireless devices in public places now prevents me from using the public library or the judicial system, participating in public meetings, going to restaurants, going shopping, and using public transportation. All are things that I used to be able to do without experiencing functional impairment prior to the proliferation of wireless devices. Most importantly, I can no longer safely access medical care due to the ubiquitous presence of wireless technology in hospitals and clinics. I am not alone. Over 300 comments from U.S. citizens pleading with the FCC to establish biologically-based safety limits for radiofrequency radiation to replace the existing outdated thermally-based radiofrequency limits were submitted in their docket to re-evaluate the RF limits.

It is extremely important that people with radiofrequency sickness be able to access hospitals, medical facilities, and government buildings. WiFi and other wireless technology poses a significant, potentially life-threatening, access barrier for people with radiofrequency sickness. Access to medical care is generally considered a human right, a right now being denied those with radiofrequency sickness. Access to public facilities by people with radiofrequency sickness is protected under the 2008 ADA Amendments which specifically protects individuals with environmentally-induced functional impairments. Radiofrequency sickness is a functional impairment induced by radiofrequency exposure, which can cause serious, even life-threatening functional impairment.

A replicated double-blind placebo-controlled study documented that cardiac arrhythmias occur in some people in response to exposure to radiation from cordless phones. This is obviously a potentially life-threatening functional impairment. My children experience cardiac arrhythmia in response to radiation from wireless technology, as do I.

My husband, a type 1 diabetic, finds that his blood sugar elevates markedly in response to radiation from wireless technology. If he tries to compensate by taking additional insulin, as he normally would, his blood sugar plunges dangerously low upon leaving the affected area. He recently had a new and very scary reaction. While at a federal office for an essential appointment, he was forced into close proximity to two functional smart phones and a WiFiing computer. He went into the office feeling fine with a normal blood sugar and came out with a very high blood sugar, a very elevated body temperature of 101 degrees Farenheit, and feeling awful. It took two days for his blood sugar and body temperature to return to normal and about a week to feel well. RF has been shown to cause calcium ion efflux.

Inappropriate calcium efflux is known to cause a condition called malignant hyperthermia which can be fatal and is usually caused by certain anesthetics. Fortunately for him, the reaction stopped accelerating when he came home to our shielded house and then crawled into our shielded bed. It could easily be a fatal reaction for someone who did not realize what was happening.

The presence of wireless radiation at levels which cause functional impairment is making it harder for us to earn our living. We had to quit bringing our pasture-raised meat products to the local farmers markets two years ago since my husband could no longer be at the market without experiencing serious neurological effects suggestive of early ALS that disappeared when he stopped attending market. I have not been able to function well enough cognitively at the market to vend for several years. Being unable to sell at the market has decreased our ability to earn our living.

Obviously, if we cannot tolerate the RF environment outside in the city, working in an office or store in the city with their multiplicity of WiFi routers and high volumes of individual cellphones would not be possible.

Disability claims related to symptoms or syndromes which have been connected to functional impairment by RF (RF Sickness) are rising. People with multiple sclerosis, fibromyalgia, chronic fatigue syndrome, asthma, and diabetes have improved when their RF exposure from wireless technology and "dirty" electricity is minimized. Eliminating RF from public places will improve accessibility and decrease disability.

It is time that national accessibility standards address the very serious access barrier posed by radiofrequency pollution.

Background

Our Experience: Wireless Technology is an Access Barrier

Radiofrequency radiation, such as the radiation given off by wireless devices and their base stations (antennas) can cause an environmentally-induced functional impairment called Radiofrequency sickness (see Dodge http://www.magdahavas.com/wordpress/wp-content/uploads/2010/08/Dodge_1969.pdf).

I have radiofrequency sickness which was originally misdiagnosed as chronic fatigue syndrome. However, once I found out I was being exposed to large amounts of radiofrequencies from electrical pollution, including "dirty" power on my wires and plumbing, and reduced that exposure as much as I was able, I began to recover almost immediately.

Here is a brief summary of symptoms I experienced as a result of the functional impairment caused by radiofrequency exposure from electrical pollution: heart palpitations, very pain sensitive, constant nerve pain, sluggish reactions, poor depth perception, muscle weakness, lactic acid buildup with little exertion, unrefreshing sleep, often wakeful in the night, fatigue, night sweats, poor circulation to my extremities, reflux, difficulty concentrating, difficulty thinking, inability to make decisions, low-grade fever and chills, headaches, and a dry sore throat.

After we reduced our exposure as much as possible, I was well at home for years and able to participate in family gatherings, go to the doctors, and generally participate in society because I could always plug

in filters to minimize the electrical pollution. We had children. When my youngest was about three, our utility began installing transmitting electrical meters in the area. Shortly after that we all began experiencing serious functional impairment, even at home, from the radiofrequency pollution the transmitting electrical meters put on the electrical wiring along with the power line communications frequencies.

Utilities providing basic service (electricity, gas, and water) should not be allowed to use transmitting utility meters. There are many examples of utility companies bullying customers with threats of disconnected service to force them to take transmitting utility meters, including my family. There are many examples of people being disabled by the radiation from transmitting utility meters and even forced from the neighborhood by the radiation from neighbors' utility meters, even when they have been able to have an analog meter on their own home (see FCC docket below for some of them). We still had analog meters and yet, the radiation coming off of our end-of-the-line transformer from all the meters and cell towers caused cardiac arrhythmias in our two young children and for my husband and me.

We slept in a tent well away from the building site while we tried to deal with the utility and PSC. Our younger son's heart rate got so slow one night when we were forced by broken tent poles to sleep at home that he lost bladder control, wetting only his underwear because the volume of urine was so small. When I went to him in response to his call, he was agitated and upset, but his heart rate was very slow and the beats were weak and irregular. This continued for a couple of hours. We did not sleep in the house again after that until the utility company removed the secondary power line from their transformer to our house. It was obvious the situation was too dangerous to be allowed to continue. So, we did the only thing we could do and told the utilities to remove our service and we went off-grid since they refused to even properly investigate the situation, never mind do anything.

After going completely off-grid, we had three heavenly weeks. We slept well, felt well, and had lots of energy. Our pets' health improved. Most importantly, our sons' cardiac rhythms had almost completely normalized.

Unfortunately, the toxic exposure we received has left our whole family extremely sensitized to radiofrequency radiation so when, in early January 2012, 4G cellphone service was installed in our area we began to experience impairment quickly. Within a week, our sons' cardiac rhythms were again highly irregular. Our younger son was again waking us in the night crying and feeling unwell with a highly irregular cardiac rhythm. We have shielded in various ways and keep pulling them back from the brink.

The drastic measures we have taken (e.g. going off-grid, shielding) to reduce their exposure have momentarily stabilized them at about early stage 2 radiofrequency sickness. (See Dodge) We are very concerned that any increase in the radiofrequency radiation levels could again push them over the edge toward stage 3 radiofrequency sickness. They should not be involuntarily exposed to a pollutant that has such profound detrimental effects on them.

We are literally trapped on our farm and in our home as outdoor radiofrequency radiation levels have climbed rapidly over the few years. We have had to restrict the amount of time our outdoors-loving sons can be outside. They are now only able to be out a half an hour at a time a few times a week. If they are out more than that with any regularity their cardiac arrhythmias become severe enough that they become symptomatic. We have difficulty going anywhere due to all the radiation from towers and the WiFi and cellphones present indoors are even worse, often causing symptomatic arrhythmias almost immediately.

Because of the serious effects exposure to radiofrequencies has on my health, we have never owned a cellphone, cordless phones, wireless router, baby monitors, or subscribed to wireless internet.

Our children both experience health problems when exposed to radiofrequencies. They feel sick, become hyperactive, less able to think logically and control their behavior. They also sleep poorly in bad radiofrequency environments. The recent increase in radiofrequency radiation exposure from the transmitting electrical meters and wireless technology has given them chronic cardiac arrhythmias which improve when we can reduce their exposure. We have done this several times only to have ambient levels increase and cause the arrhythmia to return.

We are homeschooling them so they will not be exposed to the dangerous radiofrequency environment in our local public school. The school has both WiFi and high electrical pollution levels. We are unable to bring them to the zoo, museums, most parks, indeed almost anywhere, because of the ubiquitous presence of radiation from wireless technology.

Our social isolation by wireless technology is a total violation of our civil rights. Wireless technology needs to be eliminated from public buildings and public places.

Elimination of Wireless from Public Buildings and Public Places is a Reasonable Accommodation

In consideration of wireless technology's exclusionary effect and the very real threat it poses to public health (see www.bioinitiative.org and http://www.iarc.fr/en/media-centre/pr/2011/pdfs/pr208_E.pdf) and the environment (http://www.moef.nic.in/downloads/public-information/final_mobile_towers_report.pdf), it is reasonable to eliminate radiation from wireless devices from the public arena. Internet access should be provided using publicly available wired connections. In addition, radiofrequency radiation detectors can remind people to turn off wireless devices as they enter public buildings.

My family's on-going nightmare of societal exclusion and serious functional impairment, caused by the presence of biologically active levels of radiofrequencies on the electrical grid and radiofrequency radiation transmitted into the environment through use of wireless technology, is illustrative of why it is essential to establish biologically-based radiofrequency radiation safety limits. The Environmental Protection Agency should be given the authority to do so since the FCC lacks the expertise. In the meantime, eliminating radiation from wireless technology from public places would allow people with radiofrequency sickness to participate in society.

I have maintained the website www.electricalpollution.com since 2002, shortly after I discovered that the radiofrequencies present on building wiring and flowing across the ground from non-linear time varying loads were making me, and others, sick. Research on the health effects of electrical pollution is available on the website on the Research Page. More technical information is available on the Technical Page. Electrical pollution is a very potent form of exposure to radiofrequencies. Exposure to all forms of radiofrequencies, including electrical pollution, must be included in standards regulating exposure of the general public to protect the public health during continuous exposure.

I have read widely on the research into the health effects of exposure to radiofrequencies. There is a growing body of evidence that the increased exposure to radiofrequencies from radiowave and

microwave transmitters and from electrical pollution are behind the public health crisis that has dramatically increased utilization of our medical system for chronic conditions. The article by Halberg and Johansson in *Pathophysiology*[1] supports this contention. The comprehensive review by Dr. Cherry, which documents health effects and explores mechanisms, besides thermal mechanisms, through which microwave and radiowave radiation can impact health, also supports the contention that exposure to microwave and radiowave radiation is a public health threat which is probably contributing to significant public illness. A review of the Soviet literature on radiofrequency sickness by Christopher Dodge[3] of the Naval Observatory discusses radiofrequency sickness in detail. The symptoms attributed to chronic exposure to radiofrequency radiation mirror the deterioration of health being seen in the U.S. in recent years, probably due to the dramatic increase in exposure to radiofrequencies from electrical pollution and wireless technology. Papers by Dr. Milham[4], Dr. Havas[5,6,7] and Dr. Wertheimer[8] also show that exposure to electrical pollution constitutes a public health threat, as does a report by Char Sbraggia regarding health improvements experienced by teachers and students when the electrical pollution in their school was cleaned up (http://www.electricalpollution.com/images/MelMinNurse.jpeg). These are just a few of the papers I have read. However, **they provide a picture which should illustrate how reasonable it is to institute the accommodations necessary to enable people with radiofrequency sickness to participate in community life, utilize public services, and enter public buildings.**

1. Ö. Hallberg, O. Johansson, Apparent decreases in Swedish public health indicators after1997—Are they due to improved diagnostics or to environmental factors? Pathophysiology(2009)
2. Cherry, N. 2000 Criticism of the Health Assessment in the ICNIRP Guidelines for Radiofrequency and Microwave Radiation (100 kHz- 300 GHz)
3. Dodge C. Clinical and Hygienic Aspects of Exposure to Electromagnetic Fields. Biological Effects and Health Implications of Microwave Radiation, Symposium Proceedings, Richmond, Virginia, September 17-19, 1969.
4. Milham S, Morgan L. 2008 A New Electromagnetic Exposure Metric: High Frequency Voltage Transients Associated With Increased Cancer Incidence in Teachers in a California School. American Journal of Industrial Medicine.
5. Havas M, Olstad A. 2008. Power quality affects teacher wellbeing and student behavior in three Minnesota Schools, Science of the Total Environment, July.
6. Havas M. 2006. Electromagnetic hypersensitivity: biological effects of dirty electricity with emphasis on diabetes and multiple sclerosis. Electromagnetic Biology Medicine 25(4):259-68.
7. Havas M. 2008. Dirty Electricity Elevates Blood Sugar Among Electrically Sensitive Diabetics and May Explain Brittle Diabetes. Electromagnetic Biology and Medicine, 27:135-146.
8. Wertheimer N, Savitz DA, Leeper E. 1995 Childhood Cancer in Relation to Indicators of Magnetic Fields from Ground Current Sources Bioelectromagnetics 16: 86-96.

Accommodations for people with radiofrequency sickness are really common sense and societally beneficial because radiofrequency radiation poses a serious threat to the public health.

"Public safety standards are 1,000 – 10,000 or more times higher than levels now commonly reported in mobile phone base station studies to cause bioeffects."(http://www.bioinitiative.org/conclusions/)

Accommodations necessary for people with radiofrequency sickness

Provision of Basic Services:
Utilites - water, gas, electric
People with radiofrequency sickness are being forced to choose between forced to experience serious environmentally-induced functional impairment in order to access utility services. NIDILRR needs to

put the PSC/PUCs on notice that it is their job to force utility companies to comply with the 2008 ADA Amendments which require accommodation of people with environmentally-induced functional impairment. At this time, many utilities and PSC/PUCs are flatly refusing to provide any accommodation, never mind the important accommodation of metering utility service with an analog mechanical meter which used to be standard operating procedure until recently. Many utilities are pretending these meters are no longer available. They are.

Telephone

Telephone companies must be required to provide RF interference-free copperwire telephone service to people with RF sickness. Most people with RF sickness cannot use cellphones. Cable phones and fiber optic phones can come with electronics that emit biologically significant RFI (RF interference - which can be Incidental or Unintentional, but is still biologically active) and are intolerable to some people with RF sickness. Phone companies need to provide RF filters and DSL filters to people with RF sickness without a hassle. Experience has shown that RF cross-contamination between lines (DSL to non-DSL lines) and between lines and electrical grid RF can be biologically significant so all lines should be equipped with filters. (From a public health perspective, it would be best if these were provided to all customers as a matter of course. All people experience biological effects from RF exposure, but many are either still compensating well enough they are not symptomatic or they simply do not make the connection between exposure and symptoms.)

Transportation

Most people with RF sickness are unable to use public transportation due to the presence of wireless radiation. Therefore, it is of paramount importance that people with RF sickness have access to stripped-down low RF automobiles. These would be the safest automobiles for everyone, but they are essential for those with RF sickness to retain independent mobility. For more details, please read my attached comment related to cars which was submitted into the TECHNOLOGICAL ADVISORY COUNCIL (TAC) NOISE FLOOR TECHNICAL INQUIRY (ET Docket No. 16-191).

Regulatory

The FCC Noise Rules urgently need to be updated to prevent new electrical devices, lighting, etc. from being sold and used in the public arena that block access by people with radiofrequency sickness. The existing FCC Noise Rules are solely designed to prevent technological interference. They need to be revised to prevent new electrical devices from being access barriers or from causing a public health threat. For more details, please read my attached comment about the need to update the noise limits which was submitted into the TECHNOLOGICAL ADVISORY COUNCIL (TAC) NOISE FLOOR TECHNICAL INQUIRY (ET Docket No. 16-191).

Below is a list of accommodations necessary to allow people with radiofrequency sickness to once again participate fully in public and community life. It is divided into two categories - one for transmitted radiofrequency radiation and one for radiofrequency exposure from “dirty” electricity.

Transmitted radiofrequency radiation accommodations:

- Adopt Salzburg, Austria radiofrequency radiation safety limits until biologically-based population-protective RF safety limits can be established (1microW/m2 inside and 10microW/m2 outside - lowered as necessary to prevent biological effects because our experience shows that levels should be below 3microW/m2).
- Eliminate wireless internet service from public places (including transportation).
- Transmitters on wireless devices turned off in public places - detectors should be installed at entrances to remind people.
- Hospitals only use wired internet, wired in-building networks, and wired devices within the hospital. This would also protect privacy and security.

- Cell and broadband antennas situated at a distance from hospitals and residential areas such that Salzburg radiation limits of 1microW/m2 not exceeded inside the hospital or homes.
- Medical clinics use only wired in-office network and internet service and devices.

"Dirty" electricity radiofrequency accommodations:
- Kazakstan "dirty" power standard adopted globally - maximum of 50 G/S units on Stetzerizer meter on building wiring. (www.stetzerelectric.com)
- Daylighting should be encouraged. All new lighting installations must be low radiofrequency lighting e.g. properly engineered lighting with very low or no emission of Incidental or Unintentional RF. LED lights can be engineered to this standard, but many are not at this time and therefore emit high amounts of RF. (Additional benefits - LEDs are more energy efficient than fluorescent lighting and do not emit UV thereby allowing greater access for people with lupus.)
- Use of tiered lighting instead of dimmer switches (also saves energy).

See the Solutions page at www.electricalpollution.com for a more comprehensive list of steps to minimize RF exposure.

Supplementary Information

Please visit (http://apps.fcc.gov/ecfs/comment_search/input?z=iw0f and search proceedings 03-137 and 12-357) to see the **over 300 comments from U.S. citizens pleading with the FCC to establish biologically-based safety limits for radiofrequency radiation** to replace the existing outdated thermally-based radiofrequency limits.

The 1500-page BioInitiative Report on RF/MW health effects was published in 2012. The authors are 29 scientists from ten countries. They reviewed thousands of studies showing interference with chemical processes in the body, implicating RF/MW in a whole spectrum of alarming effects including genetic damage, cancer, immune dysfunction, neurological injury, and infertility. The report can be found at www.bioinitiative.org. For people with radiofrequency sickness, these effects can be immediate and serious.

Cardiac arrhythmias can be caused by wireless technology. Recent replicated double blind studies show that a cordless phone base station operating at WiFi frequencies can cause cardiac arrhythmias in susceptible individuals. This short video discusses the cardiac effect that wireless can have- http://www.youtube.com/watch?v=_EI9fZX4iww. View this video http://www.youtube.com/watch?v=sv1E9IXUd6M to see further discussion. You can read the studies at http:// www.magdahavas.com/wordpress/wp-content/uploads/2012/01/Havas-HRV-Ramazzini.pdf and http:// www.ncbi.nlm.nih.gov/pubmed/23675629#. Obviously, for susceptible people (like those of us with radiofrequency sickness), WiFi can make whole buildings inaccessible and unsafe. A recent study in rabbits found that not only did WiFi change heart function parameters, but it dramatically changed the cardiac effects of both dopamine and epinephrine: Saili L, et al. *Effects of acute exposure to WIFI signals (2.45 GHz) on heart variability and blood pressure in Albinos rabbit*. Environmental Toxicology and Pharmacology 40 (2015) 600–605. This should be of great concern since WiFi has become ubiquitous in medical settings and may compromise the effectiveness of essential medical interventions, especially for people with radiofrequency sickness. **Medical care is considered to be a basic human right, but people with radiofrequency sickness can no longer access it without potentially endangering their lives or at least experiencing severe functional impairment.**

Causal connections between radiofrequency exposure and biological functional impairment. More recent papers look specifically at causality such as Pall ML *Microwave frequency electromagnetic fields (EMFs) produce widespread neuropsychiatric effects including depression*. J Chem Neuroanat. 2015 Aug 20. (http://www.sciencedirect.com/science/article/pii/S0891061815000599). It discusses the causal relationship between exposure to radiation from wireless technology and neuropsychiatric effects. Mechanisms of action are also discussed. Yakymenko et al discuss the fact that RF radiation is documented in numerous studies to cause oxidative damage and discusses mechanisms for bioeffects (*Low intensity radiofrequency radiation: a new oxidant for living cells* in Oxid Antioxid Med Sci 2014; 3(1):1-3) (http://www.sciencedirect.com/science/article/pii/S1382668915300594).

This case report documents the serious neurological functional impairment that exposure to radiation from wireless technology can cause. Johansson O and Redmayne M *Exacerbation of demyelinating syndrome after exposure to wireless modem with public hotspot* Electromagnetic Biolology and Medicine (http://dx.doi.org/10.3109/15368378.2015.1107839)**.**

The International Commission on Non-Ionizing Radiation Protection (ICNIRP) sets radiofrequency (RF) exposure limits for Europe that are similar to what the IEEE sets for the U.S. According to ICNIRP, FCC guidelines would not be protective for individuals with sensitivities/ impairments from low exposures of RF/MW. It is a scientific fact that even small amounts of these environmental exposures are harmful to some. ICNIRP stated the following: "*Different groups in a population may have differences in their ability to tolerate a particular NIR (non-ionizing radiation) exposure. For example, children, the elderly, and some chronically ill people might have a lower tolerance for one or more forms of NIR exposure than the rest of the population. Under such circumstances, it may be useful or necessary to develop separate guideline levels for different groups within the general population, but it may be more effective to adjust the guidelines for the general population to include such groups. Some guidelines may still not provide adequate protection for certain sensitive individuals nor for normal individuals exposed concomitantly to other agents, which may exacerbate the effect of the NIR exposure, an example being individuals with photosensitivity.*" from ICNIRP STATEMENT, GENERAL APPROACH TO PROTECTION AGAINST NON-IONIZING RADIATION PROTECTION, (HEALTH PHYSICS 82(4):540-548; 2002) (https://www.icnirp.org/documents/philosophy.pdf)

In light if this statement and all the other evidence, it is time that accessibility guidelines for hospitals, medical facilities, and other essential government buildings prohibit the presence of facility provided WiFi and other wireless transmissions within the facility. Medical records, electronic data, and the internet can be accessed perfectly well (and far more securely) using dedicated communication cables. Our doctors office has used electronic records for years which they accessed using direct cabled connections which they plugged their laptop into upon entering the office.

The Threat to Public Health Posed by Wireless Technology Makes Elimination of Wireless from Public Buildings, Hospitals, Medical Facilities, Schools, and Public Places a Very Reasonable Accommodation

The following links are of interest in spite of the fact that they relate to public health since they help with understanding that the accommodations needed for people with radiofrequency sickness are actually beneficial for public health. Wireless technology not only restricts accessibility for people with radiofrequency sickness, it jeopardizes public health.

U.S. National Toxicology Program (NTP) recently released findings that the radiation utilized by wireless technology is carcinogenic and breaks DNA. A replicated European study found that wireless radiation is also a cancer growth promoter. This excellent article by the Environmental Health Trust (http://ehtrust.org/science/facts-national-toxicology-program-cellphone-rat-cancer-study/) provides a good overview of the carcinogenicity findings.

International Scientists Appeal to U.N. to Protect Humans and Wildlife from Electromagnetic Fields and Wireless Technology (http://www.EMFscientist.org) "Today 190 scientists from 39 nations submitted an appeal to the United Nations, UN member states and the World Health Organization (WHO) requesting they adopt more protective exposure guidelines for electromagnetic fields (EMF) and wireless technology in the face of increasing evidence of risk. These exposures are a rapidly growing form of environmental pollution worldwide."

Captured Agency: How the Federal Communications Commission Is Dominated by the Industries It Presumably Regulates by Norm Alster. (http://ethics.harvard.edu/files/center-for-ethics/files/capturedagency_alster.pdf) A damning report reinforcing the contention of the International Scientist Appeal to the U.N. that regulatory agencies and standard-setting boards are not listening to researchers - read why this is happening in the U.S.

FCC Not Enforcing Existing Inadequate Radiofrequency Limits A detailed investigation by the EMR Policy Institute showed almost no enforcement of existing FCC RF limits and rampant violations (http://www.marketwire.com/press-release/-1770139.htm). A Wall Street Journal investigation (http://online.wsj.com/articles/cellphone-boom-spurs-antenna-safety-worries-1412293055) reports similar findings with one in ten towers out of compliance and experts concerned that out of compliance towers could be transmitting in the thermal range by around the end of 2015.

The International Agency for Research on Cancer (IARC), a committee of the World Health Organization, has classified RF radiation, including that emitted by wireless technology, as a class 2B carcinogen. http://www.iarc.fr/en/media-centre/pr/2011/pdfs/pr208_E.pdf.

"Electromagnetic Radiation, Health and Children 2014" by Dr. Erica Mallery-Blythe (https://www.youtube.com/watch?v=sNFdZVeXw7M) is a must-watch presentation about the hazard that RF radiation emitted by wireless technology poses to children. Dr. Mallery-Blythe does an excellent job of presenting the information in an interesting, coherent, and accessible way, but with enough detail to justify immediate action to minimize children's exposure to radiation from wireless technology.

Department of Interior: **"the electromagnetic radiation standards used by the Federal Communications Commission (FCC) continue to be based on thermal heating, a criterion now nearly 30 years out of date and inapplicable today."** (http://www.ntia.doc.gov/files/ntia/us_doi_comments.pdf)

RF radiation disrupts the endocrine system:

- Klaus Buchner and Horst Eger. Changes of Clinically Important Neurotransmitters under the Influence of Modulated RF Fields A Long-term Study under Real-life Conditions. Original study in German: BUCHNER K, EGER H (2011) Umwelt-Medizin-Gesellschaft 24(1): 44-57. http://www.radiationresearch.org/images/RRT_articles/Buchner%20Eger%20Rimbach%20Study%202011%20ENG%20FINAL%20Revised%2029%20July%202011.pdf

- Eskander EF, Estefan SF, Abd-Rabou AA. How does long term exposure to base stations and mobile phones affect human hormone profiles? Clinical Biochemistry 45 (2012) 157–161

RF radiation alters heart electrical activities and causes ventricular enlargement in rats. Additionally, "The histopathological examination revealed hypertrophy, fragmentation and vacuolation of the myocardium, which were directly proportional to the exposure time." Fatma A. Mohamed, Azza A. Ahmed, Bataa M.A. El- Kafoury, & Noha N. Lasheen. **Study Of The Cardiovascular Effects Of Exposure To Electromagnetic Field**. Life Science Journal. 2011;8(1):260-274. These findings have enormous implications for cardiac health in a chronically RF exposed population.

Exhibit F

Catherine Kleiber
ET Docket No. 16-191

DA 16-676

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
	)	
Office of Engineering and Technology	)	**ET Docket No. 16-191**
Technological Advisory Council (TAC)	)	
Noise Floor Technical Inquiry	)	
	)	

To: Office of the Secretary
Federal Communications Commission
445 12th Street SW
Washington, DC 20554

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August 11, 2016

Thank you for opening a docket on Incidental and Unintentional Radiators, as well as Unlicensed Intentional Radiators, Industrial, Scientific, and Medical (ISM) Radiators, and Licensed Radiators. Regulation of these devices needs to be tightened substantially. Regulation was originally designed to prevent equipment from interfering with other equipment. We now know that the human body is extremely sensitive to that same interference. **Since the human body cannot be "hardened" to prevent "noise" (a source of radiofrequency (RF) exposure) from affecting it, regulations need to be tightened substantially to make technology safe.** Currently, polluting technology is causing serious health problems. Our experience which I outline below is illustrative.

It is extremely important that the regulations for "dirty" electricity from all sources be tightened. Levels of "dirty" electricity seem to be higher in certain areas on the grid, resulting in serious health problems for occupants of those buildings. Predictably at risk premises seem to include buildings with the shortest wire to a shared transformer and buildings at the end of the line.

We have first-hand experience with the devastating consequences that being at the end of the line at the wrong place on the grid can have. Our story follows, but I would first like to say that occupants of two other end of the line homes in our area are suffering from terrible health. The one started experiencing problems about the same time we did. The other seemed to as well, but is less well known to us.

Furthermore, conducted RF can radiate off the wiring in unpredictable locations within a building resulting in dangerously high exposures in those locations. Please see the attached Isotrope report for more information about some such situations, as well as the companion report - Debunking the Utility: The Antenna Effect.

No one should face disability, cancer, or death due to their home's location on the grid. So it is imperative that the FCC enact health-protective regulations governing Incidental and Unintentional Radiators, as well as frequencies that conduct on the grid from Intentional Radiators (licensed and unlicensed), Industrial, Scientific, and Medical (ISM) Radiators. In short, health-protective RF regulation should apply regardless of the source of the signal.

The existing FCC radiofrequency radiation limits are too high to protect human health. The limits need to be lowered immediately. New safety limits should be enacted using a biologically-based model.

The FCC has a duty to the public to protect the public health and safety from harm from radiofrequency radiation (H.R. Report No. 104-204, p. 94).

Earlier in 2016, the U.S. National Toxicology Program released findings that RF is carcinogenic and breaks DNA at non-thermal levels.

In May 2011, IARC classified radiofrequency radiation, including radiation from all wireless technologies, as a class 2B possible carcinogen.

In 2015, 220 scientists from 42 countries with over 2,000 peer-reviewed journal articles to their collective credit in the field of biological impacts from RF/EMF appealed to the U.N. and the WHO for greater precautions with regard to exposures from wireless technologies. This is the latest in many such alerts to the health effects of RF/EMF exposure (https://www.emfscientist.org/).

In the 2012 BioInitiative Report, the authors conclude radiofrequency radiation is a carcinogen. One mechanism responsible for the carcinogenic effect of radiofrequency radiation is its ability to initiate the

Fenton Reaction, just as ionizing radiation does. The 2012 BioInitiative Report is incorporated by reference herein in its entirety (http://www.bioinitiative.org/)

The FCC radiofrequency radiation limits are outdated and obsolete. They are based on physics, not biology and, therefore, the limits are so high that they are useless for protecting the population from harmful biological effects. *"Public safety standards are 1,000 – 10,000 or more times higher than levels now commonly reported in mobile phone base station studies to cause bioeffects."*(http://www.bioinitiative.org/conclusions/)

Since the FCC lacks the expertise to establish meaningful biologically-based safety limits, it is the duty of the FCC to advocate for allocating funding and authority to the EPA to establish biologically-based safety limits. 2012 HR6358 exists as a model of legislation to do just that.

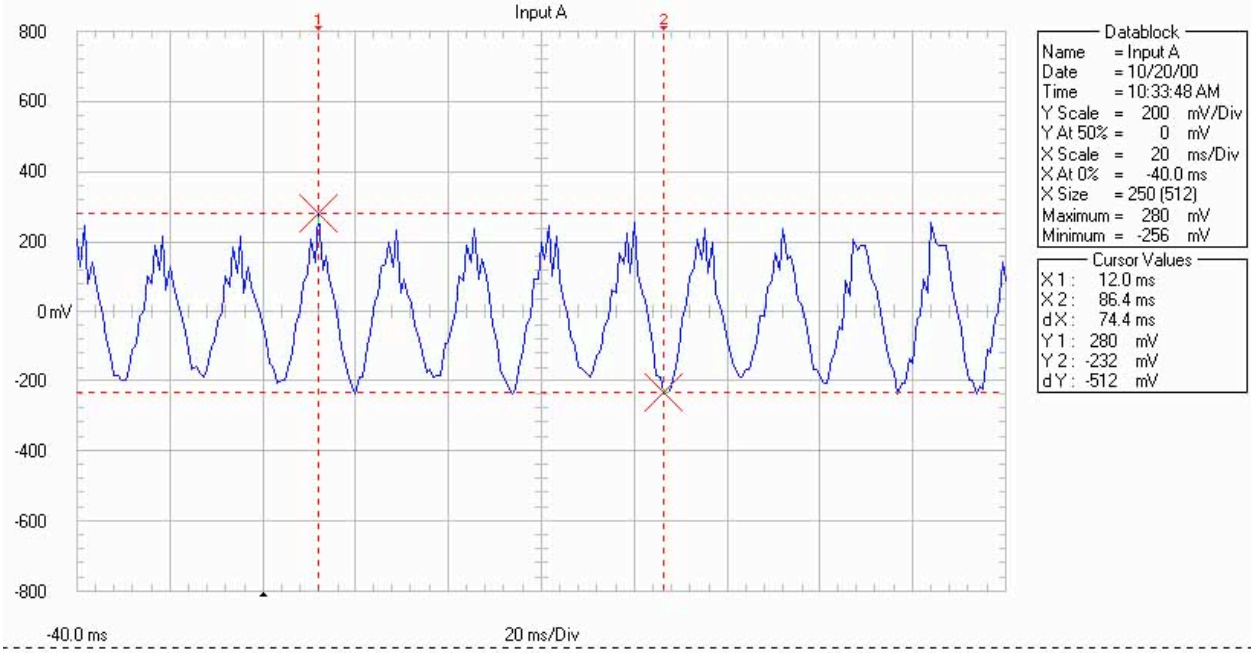
My husband and I have lived on our farm in Waterloo, Wisconsin since 1996. Later, I provide information about the monetary costs incurred by me and my family as a direct result of the FCC's negligence in not putting into place biologically-based RF safety limits years ago. The emotional and social costs have also been very steep. None of the common uses of wireless technology comes close to justifying the monetary, physical, emotional, and social price our family has been forced to pay for it, ditto AMR electrical meters.

My family's on-going health nightmare, caused by the presence of biologically active levels of radiofrequencies on the electrical grid and radiofrequency radiation transmitted into the environment through use of wireless technology, is illustrative of why it is essential that the EPA finally be empowered to establish biologically-based radiofrequency radiation safety limits and why the FCC must immediately and substantially tighten the allowable levels of RF emissions from all classes of emitters.

I have radiowave sickness. (See Dodge, incorporated by reference herein in its entirety http://www.magdahavas.com/wordpress/wp-content/uploads/2010/08/Dodge_1969.pdf) It was originally misdiagnosed as chronic fatigue syndrome. However, once I found out I was being exposed to large amounts of high frequencies from electrical pollution, including "dirty" power on my wires and plumbing, and reduced that exposure as much as I was able, I began to recover almost immediately.

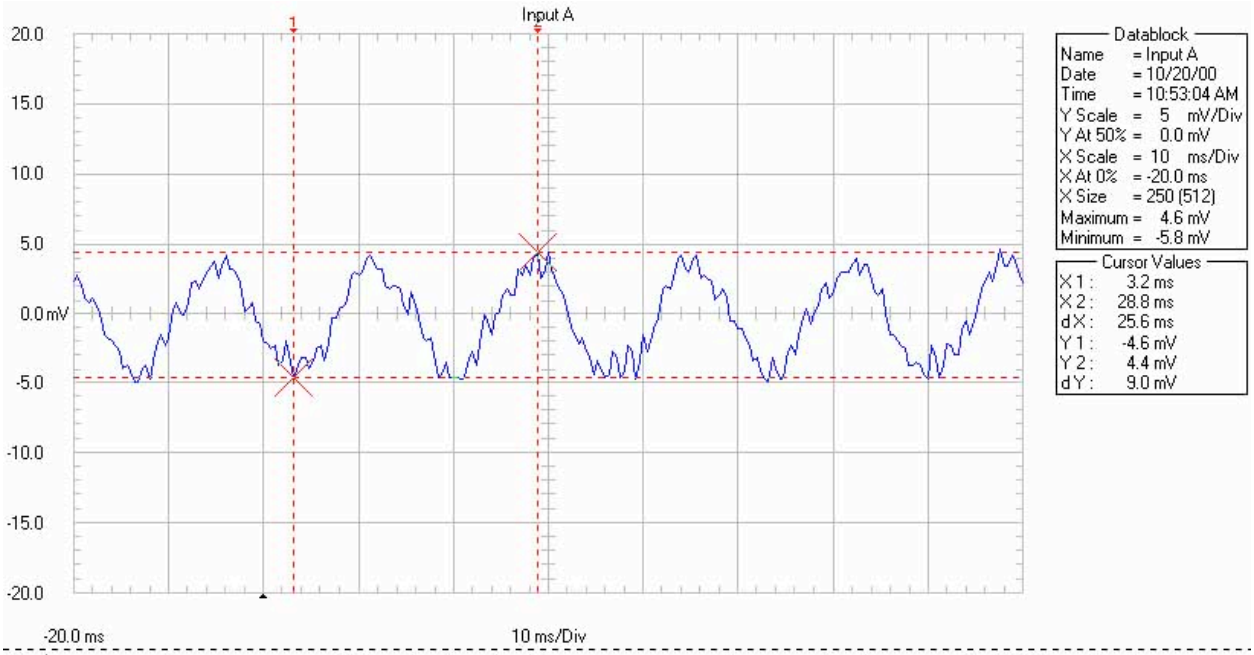
I am including waveforms that were collected at my house at the time that I found out about "dirty" electricity, electrical pollution, and capacitive coupling. They are not labeled with my name due to the fact that I removed it when I posted them on my website.

The first waveform was collected between the sink and the floor in my kitchen and illustrates how important it is that either the neutral return be adequate to return all the current, even with high frequency distortions or, preferably, that excellent device level filtering is required to prevent *Incidental* and *Unintentional* radiators from polluting the whole grid. Technology that cannot be prevented from polluting should be banned - dimmer switches may be a good example of such a technology. Three way lights - a separate filament for each level - would be a safe and reasonable substitute for those requiring adjustable lighting.



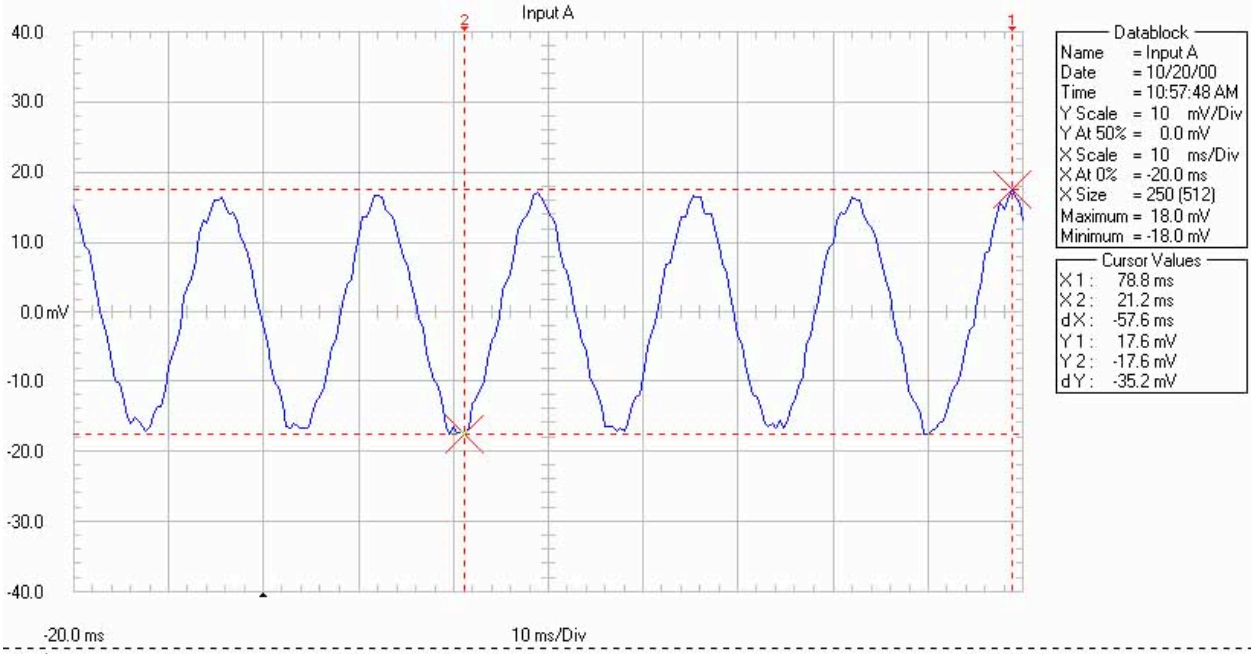
This waveform was collected at the house between the sink and an EKG placed on the kitchen floor.

The waveform below shows that the stray current caused by the inadequate return and polluting technology travels through the human body, in this case my body. However, your family members are also subject to this effect which can cause a host of health problems.



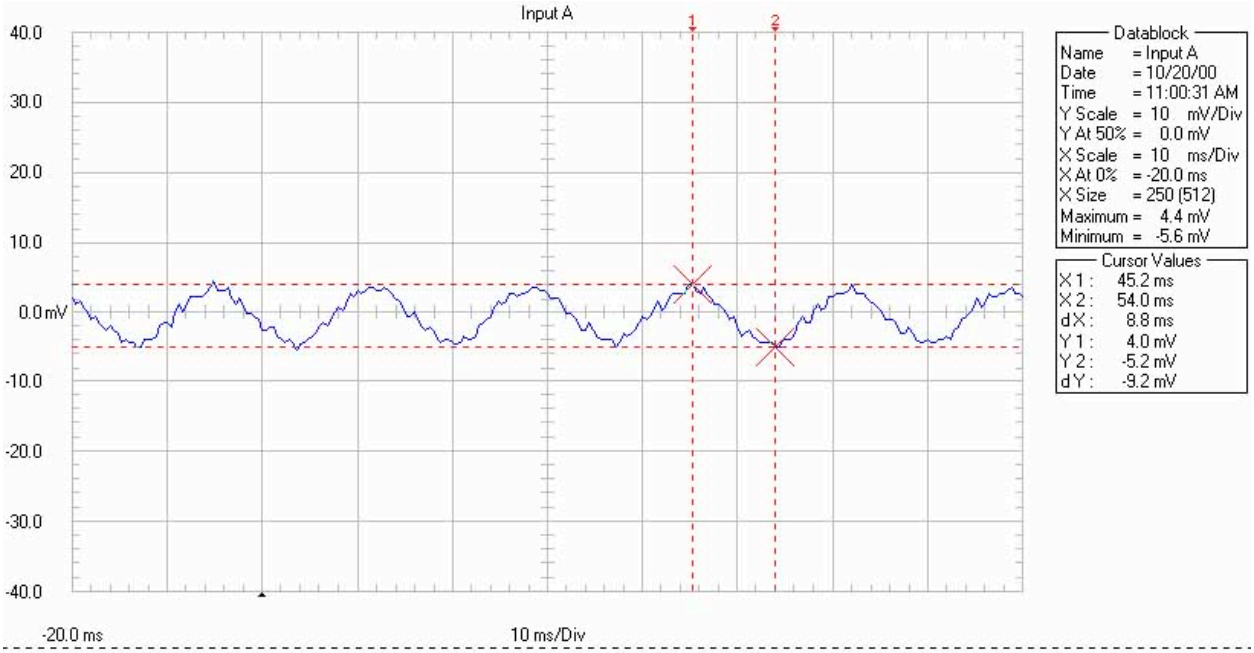
This waveform was collected at the house between 2 EKG patches placed on the ankles of while standing in front of the kitchen sink.

The waveform below shows that when I touch the kitchen sink the amplitude of the signal traveling in my body increases markedly (nearly four times). It is no wonder, then, that I used to get light-headed and dizzy while I washed fruit, vegetables, and dishes with my hands in this electrified sink. There was no "fault" causing this problem, just the electrical pollution, ground currents, and required bonding of electrical service and plumbing. Obviously, you need to dramatically tighten regulations on *Incidental* and *Unintentional* radiators to keep them from contributing to such problems.



This waveform was collected at the house between 2 EKG patches placed on ankles while she was touching the kitchen sink. NOTE THE INCREASE IN AMPLITUDE.

Finally, the waveform below shows that even while sitting on a wooden chair with my feet up on the chair seat, significant capacitive coupling to the human body occurs. The signal induced in my body is recorded below. This shows the importance of requiring good engineering to minimize any RF output onto wiring from devices. RF on wiring capacitively couples to humans (and animals) nearby. By near I mean in the building or on a sidewalk. One doesn't have to be within inches.



THE ABOVE WAVE FORM WAS BETWEEN 2 EKG PATCHES PLACE ON THE ANKLES OF WHILE SITTING ON A WOODEN CHAIR IN HER KITCHEN.

Here is a brief summary of symptoms I experienced during my high frequency related illness: heart palpitations, very pain sensitive, constant nerve pain, sluggish reactions, poor depth perception, muscle weakness, lactic acid buildup with little exertion, unrefreshing sleep, often wakeful in the night, fatigue, night sweats, poor circulation to my extremities, reflux, difficulty concentrating, difficulty thinking, inability to make decisions, low-grade fever and chills, headaches, and a dry sore throat.

We reduced our exposure as much as possible once we found out what was causing my illness both with filters and just disconnecting as much wiring as possible. I was well at home until smart meters on our neighbors' homes, worsening RF on the power lines, and 4G cell service increased our exposure enough that I began once again to experience symptoms even while in our home. We have taken additional steps to reduce our exposure to the pulse modulated microwave radiation used in wireless technology and high frequency signals on the power line.

I get sick again whenever I am around higher levels of high frequencies such as when I go into town. The degree of sickness and the exact symptoms vary depending on the duration and strength of the exposure, as well as the particular frequencies to which I am exposed.

The ambient levels of pulsed microwave radiation are now so high that I can no longer even try to go to friends' and relatives' homes, restaurants, movies, public events, or "shopping" - in the event I have to go into a store I try to arrange ahead for the item I need to be ready for me or I go in quickly, ask for assistance finding the item, buy it and leave.

I have had serious RF radiation sickness reactions to these polluted environments including cardiac arrhythmias, cognitive difficulties, short and long-term memory problems, severe neurological pain, hair loss and serious gastrointestinal effects if I try to stay longer. (See "Provocation study using heart rate variability shows microwave radiation from 2.4 GHz cordless phone affects autonomic nervous system," incorporated by reference herein in its entirety http://electromagnetichealth.org/wp-content/uploads/2010/10/Havas_HRV_Ramazzini1.pdf)

One meeting, where cellphones and wifi were present, followed by what should have been a quick trip to an office supply store, which had gotten a wireless telephone headset system since my last visit, caused serious radiation poisoning symptoms. I had cardiac arrhythmias from the radiofrequency radiation at both locations. Nerve pain began toward the end of the meeting and grew worse at the store and was so bad by the time I got home that I had to limit how my children could touch me for a couple of days. Serious gastrointestinal pain and dysfunction resulting in massive diarrhea began very shortly after arriving home and finally began to subside 3 days later. The pain and diarrhea were so severe with food that I had to quit eating for a couple of days while my intestine healed. The symptoms began at the meeting and quickly escalated while I waited nearly twenty minutes for service at the store and persisted for over 3 days. The association between the exposure and the symptoms was very clear. I consumed no food at the meeting or at the store. I had no symptoms of a bacterial/viral infection. Electrical pollution levels were also high, around 2,000 G/S units at the meeting site, but had previously not caused these reactions (I always install filters to lower the electrical pollution in the room that I am in while I am there and this time was no exception.)

We have two children whom we are homeschooling so they will not be exposed to dangerous high frequency environment in our local public school (Waterloo, WI). The school has both WiFi and high electrical pollution levels - probably caused primarily at that time by the highly polluting energy efficient lights. Today computers and other technology would be heavy contributors. At the time that I measured at least eight years ago, the levels in the school were in excess of 2000 G/S units so I went back with a meter that measured higher and found levels over 5,000 G/S units. Acceptable levels in Kazakhstan are below 50 G/S units. Obviously RF pollution from *Incidental* and *Unintentional* radiators is causing serious RF pollution problems in buildings and throughout the electrical grid.

Our children both experience health problems when exposed to high frequencies. They feel sick, become hyperactive, less able to think logically and control their behavior. They also sleep poorly in bad high frequency environments. The recent increase in radiofrequency radiation exposure has given them chronic cardiac arrhythmias which worsen markedly when they are exposed to the higher levels of pulsed microwave radiation common in society within the last couple of years. (Video demonstrates finding of cardiac arrhythmia caused by DECT phones - http://www.youtube.com/watch?v=p-mw_nCJWs4&list=UUxs1UgZ6DivWUfG1dX3TELw&index=10)

The drastic measures we have taken to reduce their exposure has momentarily stabilized them at about early stage 2 radiofrequency sickness. (See Dodge) We are very concerned that any increase in the radiofrequency radiation levels could again push them over the edge toward stage 3 radiofrequency sickness. They should not be involuntarily exposed to a pollutant that has such profound detrimental effects on them.

I have maintained the website www.electricalpollution.com since 2002, shortly after I discovered that the high frequencies present on building wiring and flowing across the ground from non-linear time varying loads were making me, and others, sick. Research on the health effects of electrical pollution is available on the website on the Research Page. More technical information is available on the Technical Page.

Electrical pollution is a very potent form of exposure to high frequencies. Exposure to all forms of high frequencies, including electrical pollution, must be included in standards regulating exposure of the general public to protect the public health during continuous exposure.

Because of the serious effects exposure to high frequencies has on our health, we do not own a cellphone, cordless phones, wireless router, baby monitors, or subscribe to wireless internet.

I have read widely on the research into the health effects of exposure to high frequencies. I believe that the increased exposure to high frequencies from radiowave and microwave transmitters and from electrical pollution are behind the public health crisis that has dramatically increased utilization of our medical system for chronic conditions. The article by Halberg and Johansson in *Pathophysiology*[1] supports this contention. The comprehensive review by Dr. Cherry[2], which documents health effects and explores mechanisms, besides thermal mechanisms, through which microwave and radiowave radiation can impact health, also supports my contention that exposure to microwave and radiowave radiation is a public health threat which is probably contributing to significant public illness. A review of the Soviet literature on radiofrequency sickness by Christopher Dodge[3] of the Naval Observatory discusses radiofrequency sickness in detail. The symptoms attributed to chronic exposure to radiofrequency radiation mirror the deterioration of health being seen in the U.S. in recent years, probably due to the dramatic increase in exposure to radiofrequencies from electrical pollution and wireless technology. Papers by Dr. Milham[4], Dr. Havas[5,6,7] and Dr. Wertheimer[8] also show that exposure to electrical pollution constitutes a public health threat, as does a report by Char Sbraggia regarding health improvements experienced by teachers and students when the electrical pollution in their school was cleaned up (MelMinNurse.pdf). These are just a few of the papers I have read. However, they provide a picture which should illustrate the need for precautionary action to minimize public exposure to high frequencies until safety standards can be established to prevent health problems in the general population during continuous exposures to high frequencies, taking into account all sources of exposure.

1. Ö. Hallberg, O. Johansson, Apparent decreases in Swedish public health indicators after1997—Are they due to improved diagnostics or to environmental factors? Pathophysiology(2009)
2. Cherry, N. 2000 Criticism of the Health Assessment in the ICNIRP Guidelines for Radiofrequency and Microwave Radiation (100 kHz- 300 GHz)
3. Dodge C. Clinical and Hygienic Aspects of Exposure to Electromagnetic Fields. Biological Effects and Health Implications of Microwave Radiation, Symposium Proceedings, Richmond, Virginia, September 17-19, 1969.
4. Milham S, Morgan L. 2008 A New Electromagnetic Exposure Metric: High Frequency Voltage Transients Associated With Increased Cancer Incidence in Teachers in a California School. American Journal of Industrial Medicine.
5. Havas M, Olstad A. 2008. Power quality affects teacher wellbeing and student behavior in three Minnesota Schools, Science of the Total Environment, July.
6. Havas M. 2006. Electromagnetic hypersensitivity: biological effects of dirty electricity with emphasis on diabetes and multiple sclerosis. Electromagnetic Biology Medicine 25(4):259-68.
7. Havas M. 2008. Dirty Electricity Elevates Blood Sugar Among Electrically Sensitive Diabetics and May Explain Brittle Diabetes. Electromagnetic Biology and Medicine, 27:135-146.
8. Wertheimer N, Savitz DA, Leeper E. 1995 Childhood Cancer in Relation to Indicators of Magnetic Fields from Ground Current Sources Bioelectromagnetics 16: 86-96.

I knew that an increase in levels of transmitted radiofrequency and microwave radiation would be very detrimental to my health and that of my family and would further impair our ability to live a normal life.

Therefore, we refused installation of the We Energies AMR meters, which transmits a spike of microwave radiation (approximately 1800 $\mu W/m^2$) every 6 seconds 24 hours a day, 7 days a week, on our two electrical services.

I asked for reasonable accommodation under the ADA because I knew that my children and I experience environmentally induced functional impairment with exposure to radiofrequency radiation, including the pulsed modulated microwave radiation utilized by the We Energies AMR meters.

My initial request was denied verbally by the PSC and in writing by We Energies.

We had to turn away at least one installer who came to install meters after we were on the record with We Energies and the PSC as not wanting an AMR meter installed.

We were concerned that we would find AMR meters installed despite our clearly expressed refusal to have AMR meters, so we padlocked our meter pedestals and installed clearly worded permanent signage.

In response to our continued refusal to allow installation of the meter, we were threatened with disconnection. (See WeEnergies9Dec2011.pdf)

My mother and father-in-law tried to refuse to take a transmitting meter so we would still be able to visit and were bullied into taking the meters by a disconnect threat. We can no longer visit. Our one try was cut short by our younger son feeling so ill that he was crying and begging to leave - in spite of it being Christmas with relatives, presents, and candy.

Both We Energies and the PSC maintained, over the phone and at the meeting with the legislators, that we had three choices and represented them as accommodation.

1. Take the AMR meters.
2. Take the AMR meters and move them anywhere on our property at our considerable expense (thousands of dollars to move them even short distances).
3. Get off-grid.

We do not consider these choices to have been any form of accommodation since we could not have moved the meters far enough to protect our health. Also, the radiofrequencies the meters produce get on the wires, essentially turning the house into a low-power microwave. This proved to be a problem even though our nearest neighbor is over half a mile away. Having two meters of our own would have worsened the effect.

We consider the refusal to accommodate us and the threat to disconnect us to have been bullying and intimidation on the part of We Energies and the Wisconsin Public Service Commission.

A group of us met with state legislators (Sen. Grothman, Rep. Jorgensen, and Connie Schulze, a staff-member of Sen. Darling's, who were supportive, but unwilling to sponsor legislation to help us.

I called numerous federal agencies - to no avail.

In March 2011, we received a letter from We Energies threatening to disconnect us within 48 hours for denying them access to the meter pedestal, which we own. This, in spite of the fact that, during a conversation about the supposed safety issue and the fact that We Energies can easily disconnect power to

our farm at our transformer in case of an emergency, Tom Held (Supervising Engineer Meter Technology) concurred saying "I know. They can pull the fuse."

We had been customers in good standing.

Again we appealed to the PSC for accommodation under the ADA (PSCMarch2011WEcutoff.pdf) and asked that they address the radiation coming off of our transformer and causing cardiac arrhythmia for our son, only to be told that they would stand by and watch us disconnected, although they would make We Energies wait until after April 15. They did not address the dangerous levels of RF radiation radiating from the transformer or the high levels of RF being conducted into our home from the utility at all. The radiating energy was sufficient to cause splits in the bark on the young maples in our yard.

After consulting multiple lawyers, realizing that the sole power to provide or deny accommodation resided with the PSC, and even being told outright by one lawyer that our best bet was to get off the grid, we began making preparations -at considerable expense- in case we were forced off-grid, fighting all the while.

We got a propane refrigerator, a pilot light gas stove, installed a gravity flow hot water heating system, acquired a generator to run our commercial freezer and installed a solar photovoltaic system to run a new DC well pump and sump pumps and converted our computer to run on DC.

We felt that the PSC was in violation of its own statutes in standing by and watching customers in good standing get disconnected and that We Energies was in violation of the law, but with no one to defend us, we had no recourse other than the one easily accessible public forum - a Letter to the Editor. (We had contacted various legal organizations including the ACLU, Public Citizen, Common Cause, and NRDC. All said that they have limited funding and they had never heard of this before. News outlets were similarly uninterested - utilities and telecom companies provide substantial funding through advertising or outright ownership.) We did also reply to the PSC.

The PSC once again refused to exercise their right to stop We Energies from disconnecting us for refusing the transmitting meter.

The PSC refused to accommodate us in large part because the AMR meters were supposedly in compliance with FCC radiofrequency limits (see PSC27Apr2011reDATCP.pdf), in spite of the fact that FCC limits were never intended to protect anyone from the biological effects we experience. Compliance with FCC limits has been used to force many many people from across the country to have devices which compromise their health.

After we wrote the letter to the editor, Sue Crane, Manager Special Projects at We Energies contacted us and asked that we remove the padlock stating that she would personally guarantee in writing that the meters would not be changed for 6 months.

On October 8, 2011, we sent letters to the PSC and We Energies requesting that they remove our electrical service since they had repeatedly ignored our requests to address the problems on their system that were causing large amounts of very high frequency radiation to radiate off of our transformer and our house wiring.

We had been forced to sleep in a tent a half mile from our home site (and at least that from other electrical services) from the end of July through October 13, 2011 - the start of early deer hunting season - in order

to stabilize our sons' cardiac health. (From the start of deer hunting until the secondary wires were removed on October 19, 2011 we slept in the bed of our full-sized truck parked in our metal machine shed with the openings facing the transformer electrically shielded and the bed opening away from the transformer. The electrical service to the shed was already disconnected thus preventing it from conducting the radiofrequencies in.)

Both sons were affected, although our younger son was affected more severely. After initial tachycardia incidents which we became aware of in the fall of 2010, they moved on to irregular heartbeat and heart rate which finally got quite slow and irregular, particularly during sleep. Additionally, Holter monitoring found that both boys had sinus arrhythmia. This is consistent with the descriptions of stages one and two of radiofrequency sickness in Dodge (attached). On a Holter monitor, our younger son only had a high of 242 bradycardia incidents hourly at the tent versus 1637 hourly at home. Our older son had a high of 165 bradycardia incidents hourly at home with no comparable due to a mistake on the part of the hospital. Our younger son's heart rate got so slow one night when we were forced by broken tent poles to sleep at home that he lost bladder control, wetting only his underwear because the volume of urine was so small. When I went to him in response to his call, he was agitated and upset, but his heart rate was very slow and the beats were weak and irregular. This continued for a couple of hours. We did not sleep in the house again after that until after the secondary lines were removed.

The deterioration in our health began shortly after the smart meters were installed in our area. Strong power line communication signals (likely related to broadband over power lines) in the 12.4 to 13.2 MHz and 25.5 to 26.3 MHz range along with communication signals (probably from the transmitting meters and cell/WiFi towers) radiating from our end of the line transformer and our home wiring seem to have been the final straw.

Signals in the 1 MHz to 80 MHz range used for broadband over power lines and communication signals are not supposed to cross the transformer. However, what happens when the signal hits the end of the line has not been considered as far as I know.

Our experience suggests that it radiates and does cross the transformer enough to radiate off of the wiring and plumbing throughout the house at biologically-harmful levels. The Isotrope report has documented smart meter transmitter frequencies traveling on wiring and radiating. I have attached it, along with its companion document - **DEBUNKING THE UTILITY INDUSTRY MYTH ABOUT SMART METER SAFETY:** THE ANTENNA EFFECT (http://www.stopsmartmetersny.org/debunkingutility.html). You may need to visit this link to view important video evidence. It is likely the AMR meter's transmitting frequencies and additional "dirty" electricity were the immediate precipitating factor for our health problems since they began shortly after AMR meter installation in the area. Additionally, Assessment of Radiofrequency Microwave Radiation Emissions from Smart Meters by Sage Associates (http://sagereports.com/smart-meter-rf/) found that smart meters are in likely violation of even existing FCC RF limits. I am attaching her declaration on this issue. Some remote read meter manufacturers are claiming that they don't have to have their meters FCC approved. I have attached the flyer for one system - Tantalus-Orion by Badger meter. If it is true, this is inadvisable and the loophole should be closed. This system made at least one person very sick when it was installed in her area. She never had a meter in her home.

We are now off-grid to protect our family's health.

After going completely off-grid, we had three heavenly weeks. We slept well, felt well, and had lots of energy. Our pets' health improved. Most importantly, our sons' cardiac rhythms had almost completely normalized and I was not awakened by them in the night.

Then, in early January 2012, 4G cellphone service was installed on existing towers in our area. Within a week, our sons' cardiac rhythms were again highly irregular. Our younger son was again waking us in the night crying, sweating profusely, and feeling unwell with a highly irregular cardiac rhythm. He was also clingy and fussy during the day. This suggests to us that 4G technology is particularly bioactive and dangerous. We heard similar stories from others when 4G installation occurred.

My husband screened all the windows with aluminum screen to reduce our son's exposure. Again, he slept through the night and was less clingy, but their cardiac rhythms remained irregular.

We are currently essentially housebound, unable to spend significant time in houses or businesses which have transmitting meters, which includes almost every electrical service in our area.

Due to the detrimental health effects that we experience, we are unable to visit friends and relatives who have transmitting meters.

We cannot completely escape the constant exposure from neighbors transmitting utility meters, 4G cellphones, and the power line frequencies which still radiate from the junction box down the road that terminates the line.

As 2012 passed, we had to do more and more shielding to compensate for the ever increasing levels of radiation from wireless technology. We have had to restrict the amount of time our outdoors-loving sons can be outside. They are now only able to be out an hour a day. If they are out more than that with any regularity their cardiac arrhythmias become severe enough that they become clingy and we are awakened in the night.

I have not been able to do all the animal care, yard care, and gardening that I need to do in the course of the year. The garden is overgrown. I have not even been able to keep the few potatoes I planted weed-free. Obviously, I cannot fit duties that usually took me 6-8 hours daily into the one hour they can be outside without triggering more serious cardiac arrhythmias. I have trouble performing the physical labor I always have and must do to earn our living since my heart often does not beating efficiently, due to the radiofrequency radiation levels.

Radiofrequency radiation levels have climbed high enough that even being inside most of the time is not protective enough to keep our sons from being symptomatic. We have had to shield further. Every little bit helps for awhile, then more people use their phones more, stream video more, the civil air defense radar switched to digital, etc and the levels increase further and we have to shield some more. How long before radiofrequency radiation levels climb high enough that being outside at all is dangerous? What happens when we have shielded the whole house and even so being inside does not offer enough protection? Who could take care of and protect my boys if anything happened to me and my husband?

I worry that I will run out of shielding options to protect my sons before meaningful biologically-based safety limits put an end to the insane increases in radiation exposure occurring rapidly now as usage of wireless technology increases. Radiofrequency sickness is serious and is life-threatening if it is not able to be properly treated by avoidance once it occurs.

The meters necessary to verify RF related problems cost over $1,500. Going off-grid, which was necessary to protect the lives of our sons, cost us over $70,000 dollars based on simple addition of the costs of all the separate parts and steps necessary to make that happen. The cost was that low because we were able to do much of the work ourselves. The solar installer estimated that the system we wished to put in at that time would cost us over $80,000 just for the solar system, not including the new heating system, refrigerator, well-pump, super-insulating the freezer, freezer generator, freezer/generator control switches, etc.

Shielding materials have cost us over $6,500 so far. It has cost over $7,000 to get new windows for the low E coating which helps block RF, again far less than most people would pay because we can install them. I cannot stress enough that these are only the monetary costs and do not include the physical, emotional, and social price our family has been forced to pay for the FCC's negligence in not implementing biologically-based safety limits. We are not wealthy and do not earn vast sums each year so it is a real question as to how long we can continue to pay for the continuous upgrades necessary to protect our family's health, yet how can we not? But, if we lose the farm doing it, what will happen to us?

FCC negligence in not establishing meaningful RF safety limits has caused us to pay more for my health insurance and therefore our sons' health insurance. The CFS diagnosis, which was really radiofrequency sickness from exposure to dirty power, caused me to become an automatic reject for health insurance. I was fortunate to be able to get health insurance through the Wisconsin Health Insurance Risk Sharing Plan (HIRSP), however even with the subsidy it was quite a bit more expensive than insurance I could have gotten as a healthy young woman. We had to have HIRSP policies for our sons as well, not due to their health which was great prior to the RF toxicity problems outlined above, but because you cannot insure children without at least one adult as primary on the policy. As an example of the great expense this caused us, the insurance quote we got in 2012, necessary to re-apply to HIRSP, for the whole family was $713.54/month. The premium for my insurance alone through HIRSP at that same time for the same $1.000 deductible was $729/month. HIRSP premiums at that same time and deductible level were $554/month for Dan and $387/month for each of the boys. Up until the 2008 flood and policy changes allowed us to qualify for health insurance assistance we were paying similar large monthly premiums. Thus, FCC negligence, resulting in the absence of biologically-based RF safety limits and my CFS diagnosis, forced our family to pay significantly more for health insurance than we would otherwise have had to.

It is important to stress our experience has been that people with radiofrequency sickness react to both RF exposures from wireless technology and "dirty" electricity.

The FCC is jeopardizing the health and lives of our children, and millions of others across the country, by not having meaningful biologically-based safety limits for radiofrequency radiation for all RF sources, including *Incidental* and *Unintentional* Radiators .

Not only is the absence of biologically-based RF safety limits in violation of common sense and the principles of public health protection, but the promotion of wireless technology, a technology that so severely restricts the activities of a portion of the population, violates the ADA, including the 2008 ADA amendments. The physical, social, and emotional costs of exclusion in spite of ADA protections and previous inclusion must be weighed in the EIS when it compares costs and benefits of the existing RF limits and enacting biologically-based RF safety limits.

We do not want to continue to be guinea pigs for the government-sanctioned rollout of new technologies with insufficient safety standards. We do not want to continue to be part of the experiment being

involuntarily carried out on the American people verifying the results of decades old research showing that the long-term health effects of these wireless signals can be profound and dangerous. (See Dodge)

The levels of radiation our family experiences on a daily basis from transmitting utility meters, wireless broadband, cellphones, cell towers, and just due to our position on the grid at the end of a line, - WITHOUT OUR PERMISSION - is already causing serious daily health problems for us.

Without conservative safety standards designed to protect the public health of our entire population during continuous exposures from all detrimental health effects and the rigorous enforcement of such standards, we fear the long-term hazards to our family's health.

We have a right to be safe in our homes and our schools and workplaces, and we have a right to current safety standards based on current science, not mistaken assumptions (the thermal model) and wishful thinking.

The existing FCC radiofrequency radiation exposure limits are way too high. Severe biological effects occur at far lower levels, as demonstrated by my family's experience, as well as in studies. If the FCC persists in ignoring this fact and does not adopt biologically-based radiofrequency radiation safety limits for all classes of RF emitters, including *Incidental* and *Unintentional* Radiators, it will be directly responsible for the ill health, even death, of millions of people. (See the 2012 BioInitiative Report - http://www.bioinitiative.org/ - for mechanisms and diseases for which links have been made in recent scientific literature and Dodge - incorporated by reference herein in its entirety http://www.magdahavas.com/wordpress/wp-content/uploads/2010/08/Dodge_1969.pdf - for connections made over 40 years ago.)

The Stetzerizer "dirty" electricity meter was evaluated in Kazakhstan and health standards were set such that no more than 50 G/S units of dirty electricity should be allowed on building wiring to protect health (www.electricalpollution.com/documents/Sanitary_Norms.pdf) and attached. Frequencies above the range of the Stetzerizer meter should also have much tighter standards. Their effect is related to capacitive coupling and energy. New standards should extend the full frequency range of existing and future *Intentional*, *Incidental* and *Unintentional* emitter output and be tight enough to protect human health. Special attention must be paid to instituting standards that prevent line ends from becoming hot spots for conducted and radiated RF. No one should face illness and disability because they happen to be located at the end of the line.

Sincerely,

Catherine Kleiber

DA 16-676
Office of Engineering and Technology
Technological Advisory Council (TAC)
Noise Floor Technical Inquiry
ET Docket No. 16-191

Catherine Kleiber
N9387 Riverview Dr.
Waterloo, WI 53594

August 5, 2016

Dear Sir or Madam,

Thank you for opening a docket on Incidental and Unintentional Radiators, as well as Unlicensed Intentional Radiators, Industrial, Scientific, and Medical (ISM) Radiators, and Licensed Radiators. Regulation of these devices needs to be tightened substantially. Regulation was originally designed to prevent equipment from interfering with other equipment. We now know that the human body is extremely sensitive to that same interference. **Since the human body cannot be "hardened" to prevent "noise" (a source of radiofrequency (RF) exposure) from affecting it, regulations need to be tightened substantially to make technology safe.** Currently, polluting technology is causing serious health problems. Cars are one area that is becoming particularly problematic. For safety reasons, regulations governing intentional, unintentional, and incidental radiators in cars need much tighter regulatory control.

Earlier in 2016, **the U.S. National Toxicology Program (NTP) released results showing that exposure to non-thermal levels of RF radiation causes cancer and DNA breakage.** Furthermore, **a replicated European toxicology study showed that RF radiation promotes cancer growth**. I have attached a comprehensive discussion of the NTP results from http://ehtrust.org/science/facts-national-toxicology-program-cellphone-rat-cancer-study/. This alone provides an important basis for tightening regulations on *Intentional, Unintentional*, and *Incidental* RF levels in cars.

The Department of Interior stated **"the electromagnetic radiation standards used by the Federal Communications Commission (FCC) continue to be based on thermal heating, a criterion now nearly 30 years out of date and inapplicable today."** in a comment on the serious danger that installation of microwave communication towers for FirstNet poses to migratory birds. http://www.ntia.doc.gov/files/ntia/us_doi_comments.pdf

U.S. Occupational Safety and Health Administration (OSHA) website acknowledges, "There are no specific standards for radiofrequency and microwave radiation issues." https://www.osha.gov/SLTC/radiofrequencyradiation/index.html

The Centers for Disease Control had precautionary statements posted on its website which were changed after attention was drawn to them (probably due to industry pressure). The original statements were "Along with many organizations worldwide, we recommend caution in cell phone use. More research is needed before we know for sure if using cell phones causes cancer."; "Scientific studies are ongoing. Someday cellphones may be found to cause health problems we are not aware of at this time."; and "Children who use cell phones – and continue to use them as they get older – are likely to be around RF for many years. If RF does cause health problems, kids who use cell phones may have a higher chance of developing these problems in the future." (http://www.prlog.org/12359483-cdc-issues-precautionary-health-warnings-about-

cell-phone-radiation.html) These statements have been replaced with statements expressing more uncertainty and calling for more research, in other words typical industry stall statements, very distinct from statements of safety (http://www.prlog.org/12362077-cdc-retracts-its-precautionary-health-warning-about-cell-phone-radiation.html).

At least 98 experts are calling for the FCC to modernize their outdated thermally-based RF limits because the limits do not protect from most biological effects and only apply to very short-term exposures for a large male (http://www.prlog.org/12245111-everything-you-wanted-to-know-about-cell-phone-radiation.html). Most of the population is now continuously exposed and most do not fit the description of a large male.

According to **The International Commission on Non-Ionizing Radiation Protection (ICNIRP),** "*Different groups in a population may have differences in their ability to tolerate a particular NIR (non-ionizing radiation) exposure. For example, children, the elderly, and some chronically ill people might have a lower tolerance for one or more forms of NIR exposure than the rest of the population. Under such circumstances, it may be useful or necessary to develop separate guideline levels for different groups within the general population, but it may be more effective to adjust the guidelines for the general population to include such groups. Some guidelines may still not provide adequate protection for certain sensitive individuals nor for normal individuals exposed concomitantly to other agents, which may exacerbate the effect of the NIR exposure, an example being individuals with photosensitivity.*" from ICNIRP STATEMENT, GENERAL APPROACH TO PROTECTION AGAINST NON-IONIZING RADIATION PROTECTION, (HEALTH PHYSICS 82(4):540-548; 2002) https://www.icnirp.org/documents/philosophy.pdf

In 2015, 220 scientists from 42 countries with over 2,000 peer-reviewed journal articles to their collective credit in the field of biological impacts from RF/EMF appealed to the U.N. and the WHO for greater precautions with regard to exposures from wireless technologies. This is the latest in many such alerts to the health effects of RF/EMF exposure https://www.emfscientist.org/.

Radiofrequency radiation, which includes the radiation emitted by wireless devices, as well as *Incidental* and *Unintentional* radiators, was classified by IARC as a class 2B possible human carcinogen, similar to lead, DDT, and chloroform, in 2011.[1] There are an increasing number of experts stepping forward to say that that classification should be changed to either 2A "probable" carcinogen[2] or even class 1 - carcinogen.[3] Even if the classification is not changed, exposure to a class 2B carcinogen should be minimized in vehicles, especially in light of the aforementioned NTP carcinogenicity findings.

There are numerous studies showing that radiation from wireless technology seriously harms a variety of animal species and also plants, impairing reproduction, growth, and navigation.[4,5,6]

The Soviet Union performed large amounts of research and found biological effects at levels far below our "safety" guidelines, hence their much lower safety limits.[7] Our current safety regulations are not designed to protect people from the non-thermal hazards posed by transmitting meters or other devices. The FCC "safety" standards are solely designed to protect a 6 ft 185 lb man from tissue heating during a short (6 minute) exposure. They are not designed to protect even a 6 ft man from biological effects during a continuous exposure.[8] They are not designed to protect women, children, and smaller men even during short-term exposures. Since the general population is continuously exposed, these "safety" standards are meaningless for the population as a whole.[9]

A number of studies show that electromagnetic radiation, including radiofrequency radiation, alters heart rate variability, blood pressure (including inducing hypertension with microwave exposure) and increases risk of arrhythmia related heart disease and heart attack.[7,10,11,12,13]

Recent replicated double blind studies show that a cordless phone base station operating at WiFi frequencies can cause cardiac arrhythmias in susceptible individuals.[11,12,13] This short video discusses the cardiac effect that wireless can have- http://www.youtube.com/watch?v=_EI9fZX4iww. View this video http://www.youtube.com/watch?v=sv1E9IXUd6M to see further discussion, including the fact that regular screening for cardiac susceptibility prior to exposure, and at least yearly thereafter, would be recommended according to RF exposure protocols. The very serious consequences of cardiac arrhythmia or arrest while operating a vehicle should impel the FCC to tighten RF limits on all classes of RF emitters in vehicles.

Obviously, wireless technology does not belong in cars - if it can induce arrhythmia, it can also cause cardiac arrest, a fact Frey proved in frogs years ago.[14] **Cardiac arrest is undesirable at any time but when a person is operating a large potentially lethal object, it is particularly so.** Cardiac arrest has also been related to other RF exposures [15] so RF exposures from *Unintentional* and *Incidental* emitters should also be minimized.

Wireless technology was NOT safety tested prior to release. Safety is only "proven" by continued industry insistence that the only way wireless technology can have any biological effect is through thermal or tissue heating effects. This is totally untrue. Disconnect by Devra Davis, an epidemiologist, discusses the coverup and research supporting non-thermal biological effects at great length. She also discusses research done years ago demonstrating the ability of pulsed microwave radiation to stop the heart. Cellular Telephone Russian Roulette (http://microondes.files.wordpress.com/2010/03/robert_c_kane_cellular_telephone_russian_roulette.pdf), written by Robert C. Kane, a former Motorola engineer, discusses the fact that numerous studies show that significant biological effects occur at such low levels that useful wireless technology is by definition unsafe wireless technology. He further discusses the problem of microscopic, but biologically harmful hot spots which occur at levels far below those normally considered to cause thermal harm.

There is extensive documentation in the literature of alterations of Ca^{2+} homeostasis.[10] This is likely to be responsible at least in part for the profound effects that radiofrequency radiation has on the heart and neurological function. Ca^{2+} regulates gap junction opening. Gap junctions are key in many intercellular communications. "*Microwave electromagnetic fields act by activating voltage-gated calcium channels: why the current international safety standards do not predict biological hazard*" has concrete suggestions for how to quickly enact a first revision of the FCC RF safety limits to protect against many of the biological effects of exposure to RF.[16] RF can have serious psychological effects, including anxiety, irritability, and depression. Links are also made to psychosis and other psychological disorders.[17] With all the problems with road rage etc., the last thing this country needs is for drivers or passengers to be exposed to any more RF in their vehicle than absolutely necessary. There is plenty of evidence to justify a meaningful initial revision of FCC vehicle safety codes to minimize RF exposure from all sources within vehicles while further study is done to determine the shape of future revisions.

Exposure to radiofrequency radiation also interferes with the action of enzymes, signaling pathways, and makes the immune system simultaneously hyperactive and less effective.[10,18] Immune impairment results in part from the disruptive effect of radiofrequency radiation on calcium ion homeostasis. In addition to radiofrequency radiation-induced immune impairment increasing risk of various types of infection, it is likely to increase the risk of getting cancer from the DNA breakages radiofrequency radiation is well-documented to induce.[19] Now also substantiated by the NTP results. While radiofrequency radiation is non-ionizing, the metabolic changes it can cause result in oxidative damage to DNA and subsequent breakage. Direct interactions between radiofrequency radiation and DNA can have similar results, as well as causing changes in gene transcription, through changes in electron flows induced by the radiation.[19]

Neurological function can be seriously impaired by radiofrequency radiation. Cholinesterase enzyme activity is impaired by exposure to radiofrequency radiation in a manner similar to impairment caused by organophosphate pesticides, often rendering a person with radiofrequency sickness particularly sensitive to small amounts of chemicals.[20] Radiofrequency radiation can lower the pain threshold, slow reaction times, cause fatigue, muscle weakness, headaches, difficulty concentrating, short-term memory problems and even memory loss.[7,18,19,21] These may be caused by disruption of Ca^{2+}, disruption of various enzyme pathways, induction of the stress response and associated effects, increased permiability of the blood-brain barrier, or various other effects of over-exposure to radiofrequency radiation.[7,10,20]

Radiofrequency radiation significantly decreases melatonin levels, causing poor quality sleep, and also decreases the ability of existing melatonin to fight cancer.[10]

All these biological effects are good reasons to REMOVE sources of exposure to RF from vehicles. A review of old Soviet literature discusses the fact that reflexes, including conditioned reflexes, are slower in individuals exposed to RF. They go on to state "It is possible to observe degeneration of the neurons in the cerebral cortex and the basal ganglia, the pons, the medulla oblongata, and in some cases even the cerebellum, as well as histological and chemical changes in the vicinity of nerve fibers." Obviously, it is not a good idea to have an environmental toxin that can impair reflexes and damage nerves inside vehicles whose safe operation relies on those very reflexes and good neurological and brain function.[7]

Many more people are adversely affected by RF radiation than realize it. Radiation from wireless devices may exacerbate the effects of a distraction such as conversation and impair reflexes and slow brain processing even at the lower levels phones emit when not connected. This may occur in part due to RF lowering dopamine levels, [22] as well as the other effects mentioned above.

"A Comparison of the Cell Phone Driver and the Drunk Driver" shows delays in reaction times that may relate to the RF emissions from the phone.[23] Unfortunately, driving studies have not been designed to examine whether it is the RF emissions of the phones that are causing the problem. In "Examining the Impact of Cell Phone Conversations on Driving Using Meta-Analytic Techniques," the authors state "There was a similar pattern of results for passenger and remote (cell phone) conversations." [24] However, it is not clear whether both driver and passenger had their cellphones on and emitting at the time of the conversation, which would obviously be a confounder. Measuring Cognitive Distraction in the Automobile, [25] a recent report on distracted driving also provides data additional technology in cars may not be safe. Unfortunately, the potential effect of the RF exposure itself whether from transmitters, electronics, or the vehicle electrical system was not factored into the experimental design. An article with the great title "*A Problem of the Brain, Not the Hands: Group Urges Phone Ban for Drivers*" (http://www.nytimes.com/2009/01/13/health/13well.html?_r=1&) probably has it right - although perhaps not for the right reason. Radiation from cellphones does indeed interfere with brain function, thus it may matter little whether the driver is conversing on a phone they hold, hands-free, or, indeed, with a passenger, as long as phones are on in the car or the area is high in wireless radiation. Ambient microwave radiation levels have gotten quite high in many metropolitan areas.

There are long-term public health implications of wireless radiation exposure. Detrimental biological effects, distinct from tissue heating effects, have been extensively documented in studies at a range of different frequencies and at levels below the current United States safety standard.[10,26,27] Many other nations already have more rigorous safety standards than does the US. Microwave and radiofrequency radiation are now being associated with attention deficit disorder, autism, sleep disorders, multiple sclerosis, Alzheimer's disease and epilepsy, as well as asthma, diabetes, malignant melanoma, breast cancer, and other illnesses that have become increasingly more common. Please see www.bioinitiative.org to read a 2012 review of the peer-reviewed science on the long-term risks of exposure to transmitted microwave and radio frequency

radiation. Studies finding no health effects are predominantly industry funded.[28] A report by Hallberg and Johansson[29] published recently in Pathophysiology asks the provocative question about whether the recent (1997 and later) increase in exposure to microwave frequencies may be responsible for the recent decline in public health in Sweden. The data seem to say that public exposure to microwave frequencies is a likely culprit.

Independent reviews such as "Criticism of the Health Assessment in the ICNIRP Guidelines for Radiofrequency and Microwave Radiation (100 kHz - 300GHz)" (www.electricalpollution.com/documents/Cherry2000EMR_ICNIRP_critique_09-02.pdf), first completed on behalf of Ministry of Health/ Ministry for the Environment of New Zealand, and the BioInitiative Report, written by highly qualified independent scientists (www.bioinitiative.org), conclude that there are biological effects at levels well below existing safety limits. Both reviews find existing RF limits to be completely inadequate.

In light of the very serious threat that RF poses to public health, limiting exposure to RF in vehicles from all sources makes sense. This would have the added benefit of providing persons with radiofrequency sickness a safe method of travel and allowing them to fully exercise their civil rights.

Radiofrequency sickness is a functional impairment caused by overexposure to radiofrequencies, which includes the pulsed modulated microwave frequencies used in wireless communication, as well as *Incidental* and *Unintentional* radiators.[7,10,20,21] Once one has radiofrequency sickness, exposure to radiofrequencies causes functional impairments which can range from frustrating to life-threatening. EHS or electrohypersensitivity, which often encompasses radiofrequency sickness, affected 3% of the population twelve years ago, according to the California State Department of Health. More recent independent studies show the numbers may be higher now. A recent Amicus Brief discusses recognition, prevalence, etc.[30]

The proliferation of wireless technology is increasing the number of people with radiofrequency sickness and also restricting the daily activities of people with radiofrequency sickness. Past rules changes have made it more difficult for people with radiofrequency sickness to get vehicles that do not give them symptoms - one example is the requirement for wireless tire pressure gauges. While the radiation levels emitted are below the FCC guidelines, that is irrelevant in terms of biological symptoms and safety, as previously discussed. A rules change that results in minimizing RF levels in vehicles would benefit everyone, improving public health, but it would particularly benefit the growing segment of the population experiencing RF sickness.

The FCC has extra responsibility under the American's with Disabilities Act (ADA) to make personal vehicles safe for persons with radiofrequency sickness since private vehicles are often the only way people with radiofrequency sickness can travel due to the rampant proliferation of wireless technology.

Symptoms that occur with RF radiation exposure vary depending on the particular frequencies involved, their amplitude, and the duration of exposure and the size, height, and build of the exposed person. Headache, brain-fog, short-term memory loss, scattered thinking, irritability, nerve pain, muscle weakness, heart palpitations, and appetite loss are common. Longer stays in polluted environments intensify and worsen the symptoms.[7]

It is important that the FCC Office of Engineering and Technology promulgate rules related to vehicle engineering to minimize RF exposure from all sources within vehicles so that vehicles are not causing radiofrequency sickness in previously well individuals and such that there are well-engineered vehicles that are safe for people with radiofrequency sickness.

Radiation from wireless devices is not the only source of exposure to RF in cars. High frequency signals on wiring also occur in cars and cause radiofrequency sickness. Milham and Morgan found a dose-response

relationship between high frequencies present on building wiring and cancer.[31] Removing high frequencies on building wiring has improved MS symptoms, blood sugar levels, asthma, sleep quality, teacher health, headaches, ADD, and numerous other health problems.[32,33,34] Technical papers provide a solid electrical and biomolecular basis for these effects. A recent paper by Ozen showed that transients induce much stronger current density levels in the human body than does the powerline 60Hz signal.[35] Another technical paper discusses the authors' findings that high frequency communication signals on power lines also induce much stronger electrical currents in the human body than a low frequency signal of the same strength.[36] The induced currents disturb normal intercellular communications. This causes harmful short-term and long-term effects. The effects seem to be the same whether the system is AC or DC since the most biologically active component is the "noise" from poorly engineered devices. (Please see www.electricalpollution.com for more information.)

Electrical engineering and biological sciences are largely separate disciplines. Biologists, molecular biologists, and doctors have been largely unaware of the high frequency pollution of electrical systems (AC and DC). The assumption, until recently, by biologists was that AC and DC systems were "clean". This is not so and has not been so for many many years. This has been well known by electrical engineers, but they have been taught that from a biological standpoint it is insignificant, after all the pollution, even in extreme cases, usually does not amount to much more than a couple of volts and in many cases is measured in millivolts. However, the assumption of safety is proving not to be true.[31,32,33,34,35,36] This shows the importance of establishing vehicle standards that reflect the biological reality, especially since any biological impairment caused by poor engineering could cost lives. If proper standards are established, and the above mentioned references offer a good basis for establishing initial standards, safe un-polluted cars can be engineered. This would benefit everyone in the long run and decrease the isolation of people with radiofrequency sickness.

Cars used to be lower RF environments. They now have wireless tire pressure gauges, bluetooth, wifi, cellphones, large stereo or even video systems in close proximity to drivers. Unfiltered and unshielded spark plugs, ignition switches, alternators, fuel pumps, and a variety of other DC motors also contribute RF that is conducted around the car on wires and returned on the frame, often leading to recognized RF interference problems * and unrecognized RF health problems. These problems have worsened as cars have had more and more electronics and wiring installed. RF used to be limited to *Incidental* and *Unintentional* sources and in basic models with mostly mechanical features, the exposures were tolerable. More electrical wiring which conducts the "noise" into close proximity to occupants causes RF health effects due to increased exposure through capacitive coupling and radiation from wiring. Furthermore, RF health effects result from cumulative exposure, so the more there is overall, the less tolerance there is for the contribution of any one source. **In addition to requiring minimization of *Incidental* and *Unintentional* RF exposure through good engineering, the FCC should require all current be conducted on wires.** The frame should only be used as a ground, not a return.

Our family's experience with RF-induced functional impairment, supported by the literature and many other first-hand reports, strongly suggests that the proliferation of wireless technology and electrically polluting electrical technology is a serious public health threat that is likely to be behind many of the rapidly increasing public health problems such as multiple sclerosis, fibromyalgia, chronic fatigue syndrome, diabetes, asthma, allergies, migraines, ADD/ADHD, sleep disorders, etc. Please publicly acknowledge the inadequacy of the current thermally based FCC guidelines and re-evaluate vehicle standards to require safe clean electrical systems and eliminate transmitters from within the vehicle. Filtering of electrical systems can be quite simple and inexpensive and should be undertaken in all vehicles by the manufacturers. A further step toward safety would be to include a shielded compartment for the storage of cellphones and tablets so that even those who do not know how to turn them completely off will be safer drivers. Manufacturer installed wireless technologies should be banned within the vehicle to minimize driver impairment. In fact,

great attention should be paid to whether electronics installed within vehicles contribute to impaired driving and unsafe passenger conditions. Certain types of installations, such as screens on the backs of headrests, may need to be banned.

In short, automated vehicles utilizing wireless signals (V2V), other wireless technologies installed in the vehicles, and polluting electrical technology are unsafe and access-limiting. Please protect the health and rights of the citizens of this great country - enact biologically-protective RF limits for all sources of RF within vehicles.

The Stetzerizer "dirty" electricity meter was evaluated in Kazakhstan and health standards were set such that no more than 50 G/S units of dirty electricity should be allowed on building wiring to protect health (www.electricalpollution.com/documents/Sanitary_Norms.pdf) and attached. Standards in cars may need to be even tighter due to proximity and the serious risk driver cognitive impairment or cardiac effects pose to the public. Frequencies above the range of the Stetzerizer meter should also have much tighter standards. Their effect is related to capacitive coupling and energy. New standards should extend the full frequency range of existing and future intentional and unintentional transmitter output and be tight enough to protect human health.

Thank you.

Sincerely,

Catherine Kleiber

References:

1. IARC CLASSIFIES RADIOFREQUENCY ELECTROMAGNETIC FIELDS AS POSSIBLY CARCINOGENIC TO HUMANS PRESS RELEASE N° 208 http://www.iarc.fr/en/media-centre/pr/2011/pdfs/pr208_E.pdf
2. Devra Lee Davis, Santosh Kesari, Colin L. Soskolne, Anthony B. Miller, Yael Stein. "Swedish Review Strengthens Grounds for Concluding That Radiation from Cellular and Cordless Phones Is a Probable Human Carcinogen;" *Pathophysiology* - April 2013 (Vol. 20, Issue 2), Pages 123-129,http://www.pathophysiologyjournal.com/article/S0928-4680(13)00003-5/abstract
3. Hardell and Carlberg. "Using the Hill Viewpoints from 1965 for Evaluating Strengths of Evidence of the Risk for Brain Tumors Associated with Use of Mobile and Cordless Phones," *Reviews on Environmental Health*, Volume 28 (November 2013), Issue 2-3, Pages 97–106, http://dx.doi.org/10.1515/reveh-2013-0006 .
4. "*Impacts of radio-frequency electromagnetic field (RF-EMF) from cell phone towers and wireless devices on biosystem and ecosystem – a review*" (http://www.biolmedonline.com/Articles/Vol4_4_2012/Vol4_4_202-216_BM-8.pdf)
5. "*Report on Possible Impacts of Communication Towers on Wildlife Including Birds and Bees*" (http://www.moef.nic.in/downloads/public-information/final_mobile_towers_report.pdf)
6. Warnke U. BEES, BIRDS AND MANKIND: Destroying nature by "electrosmog"
7. Marha K, Musil J, and Tuha H. Electromagnetic Fields and the Life Environment. Institute of Industrial

Hygiene and Occupational Diseases, Prague, Czechoslovakia. English Translation 1971
8. A letter from Norbert Hankin, Center for Science and Risk Assessment, Radiation Protection Division, EPA, regarding the limitations and purpose of the FCC exposure standards. http://www.emrpolicy.org/litigation/case_law/docs/noi_epa_response.pdf
9. Identification of Research Needs Relating to Potential Biological or Adverse Health Effects of Wireless Communication, 2008, National Academy of Science.
10. Cherry, N. 2000 Criticism of the Health Assessment in the ICNIRP Guidelines for Radiofrequency and Microwave Radiation (100 kHz- 300 GHz)
11. Havas, J. Marrongelle, B. Pollner, E. Kelley, C.R.G. Rees, L. Tully. Provocation study using heart rate variability shows microwave radiation from DECT phone affects autonomic nervous system. Eur. J. Oncol. Library, vol. 5, 2010 http:// www.magdahavas.com/wordpress/wp-content/uploads/2012/01/Havas-HRV-Ramazzini.pdf
12. M Havas and J Marrongelle. Replication of Heart Rate Variability Provocation Study with 2.4 GHz Cordless Phone Confirms Original Findings Electromagn Biol Med. 2013 Jun;32(2):253-66. doi: 10.3109/15368378.2013.776437. http:// www.ncbi.nlm.nih.gov/pubmed/23675629#
13. M Havas. Radiation from wireless technology affects the blood, the heart, and the autonomic nervous system Rev Environ Health 2013; 28(2-3): 75–84
14. A.I. Frey and E.S. Eichert. MODIFICATION OF HEART FUNCTION WITH LOW INTENSITY ELECTROMAGNETIC ENERGY. JOURNAL OF BIOELECTRICITY 5(2), 201-210 (1986)
15. N. Cherry. Cardiac Effects of Natural and Artificial EMR (http://www.electricalpollution.com/documents/Cherry_EMR_Cardiac_Effects_Review.pdf)
16. M Pall. Microwave electromagnetic fields act by activating voltage-gated calcium channels: why the current international safety standards do not predict biological hazard. Recent Res Devel Mol Cell Biol 7 (2014) (http://www.electricalpollution.com/documents/Pallmicrow-vgccnoheat.pdf)
17. M Pall. Microwave frequency electromagnetic fields (EMFs) produce widespread neuropsychiatric effects including depression. Journal of Chemical Neuroanatomy. 2015 (http://dx.doi.org/10.1016/j.jchemneu.2015.08.001)
18. Johansson O. Disturbance of the immune system by electromagnetic fields—A potentially underlying cause for cellular damage and tissue repair reduction which could lead to disease and impairment, Pathophysiology, Volume 16, Issues 2-3, August 2009, Pages 157-177.
19. Blank M and Goodman R. Electromagnetic Fields May Act Directly on DNA, Journal of Cellular Biochemistry 75:369-374 (1999)
20. Grant L. Microwaves Imitate Pesticides. U.S. Department of Energy Risk Management Quarterly, Volume 5-3M.
21. Johnson Liakouris AG. Radiofrequency (RF) sickness in the Lilienfeld study: An effect of modulated microwaves Archives of Environmental Health; May/Jun 1998; 53, 3.
22. Klaus Buchner and Horst Eger. Changes of Clinically Important Neurotransmitters under the Influence of Modulated RF Fields¸A Long-term Study under Real-life Conditions Original study in German: BUCHNER K, EGER H (2011) Umwelt-Medizin-Gesellschaft 24(1): 44-57. http://www.radiationresearch.org/images/RRT_articles/Buchner%20Eger%20Rimbach%20Study%202011%20ENG%20FINAL%20Revised%2029%20July%202011.pdf
23. "A Comparison of the Cell Phone Driver and the Drunk Driver" http://www.distraction.gov/download/research-pdf/Comparison-of-CellPhone-Driver-Drunk-Driver.pdf
24. "Examining the Impact of Cell Phone Conversations on Driving Using Meta-Analytic Techniques" (http://hfs.sagepub.com/content/48/1/196.abstract)
25. Strayer, D.L., et. al. Measuring Cognitive Distraction in the Automobile (June 2013), AAA Foundation for Traffic Safety https://www.aaafoundation.org/sites/default/files/MeasuringCognitiveDistractions.pdf
26. Hyland GJ. Physics and biology of mobile telephony. The Lancet, Vol 356, November 25, 2000.
27. Santini R, Santini P, Le Ruz P, Danze JM, and Seignel M. 2003 Survey Study of People Living in the Vicinity of Cellular Phone Base Stations. Electromagnetic Biology and Medicine Vol. 22, No. 1, pp.

4149.
28. Huss et al., "Source of Funding and Results of Studies of Health Effects of Mobile Phone Use: Systematic Review of Experimental Studies", Environmental Health Perspectives, 115(1): 1-4, 2007. http://www.ehponline.org/members/2006/9149/9149.pdf.
29. Hallberg O, Johansson O, Apparent decreases in Swedish public health indicators after 1997 – Are they due to improved diagnostics or to environmental factors? Pathophysiology Volume 16, Issue 1, June 2009, Pages 43-46.
30. BRIEF OF AMICI CURIAE IN SUPPORT OF APPELLANT, COURT OF APPEALS OF THE STATE OF NEW MEXICO, No. 32,549, FIRSTENBERG v. RAPHAELA MONRIBOT, On appeal from the First Judicial District Court, Division II, County of Santa Fe, State of New Mexico, The Hon. Sarah M. Singleton, Case No. D-101-CV-2010-29
31. Milham S, Morgan L. A new electromagnetic exposure metric: High frequency voltage transients associated with increased cancer incidence in teachers in a California school, American Journal of Industrial Medicine, Volume 51, Issue 8, Date: August 2008, Pages: 579-586
32. Havas M, Olstad A. Power quality affects teacher wellbeing and student behavior in three Minnesota Schools, Science of the Total Environment, Volume 402, Issues 2-3, 1 September 2008, pp. 157-162.
33. Havas M. 2008. Dirty Electricity Elevates Blood Sugar Among Electrically Sensitive Diabetics and May Explain Brittle Diabetes. Electromagnetic Biology and Medicine, 27:135-146. http://www.informaworld.com/smpp/content~db=all?content=10.1080/15368370802072075
34. Havas M. 2006. Electromagnetic hypersensitivity: biological effects of dirty electricity with emphasis on diabetes and multiple sclerosis. Electromagnetic Biology Medicine 25(4):259-68.
35. Ozen, S. 2007. Low-frequency Transient Electric and Magnetic Fields Coupling to Child Body, Radiation Protection Dosimetry (2007), pp. 1–6. http://rpd.oxfordjournals.org/cgi/content/full/ncm315
36. Vignati, M. and L. Giuliani, 1997. Radiofrequency exposure near high-voltage lines. Environ Health Perspect 105(Suppl 6):1569-1573 (1997) http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1469914

Exhibit F

DEBUNKING THE UTILITY INDUSTRY MYTH ABOUT SMART METER SAFETY:

THE ANTENNA EFFECT

The utility industry's argument that smart (AMR, ERT) meters are safe must be rejected, because it relies on FCC testing for radiofrequency (RF) interference, which is not a safety testing protocol, and flawed FCC radiation exposure guidelines. The FCC testing for smart meters is done in an isolated laboratory, divorced from the context in which these meters are intended to be used, connected to the wiring in a home or business.

We present below compelling technical and empirical proof that, when these meters are used as intended, they cause an antenna effect, inflicting great harm to occupants inside their homes and businesses. **When used as intended, smart meters that appear to be safe in the testing laboratory are lethal.**

1. An RF engineer's technical report confirms that smart meters cause an antenna effect when connected to electrical distribution systems, resulting in extraordinary RF exposures that are significantly higher than those reported in isolated laboratory testing.

Stop Smart Meters New York (SSMNY) hired an RF engineering firm named Isotrope "[t]o evaluate the devices in situ" and to make "a field survey of the various emissions of concern, employing an array of electronic test equipment." Isotrope concluded, among other things, that the radiated- and conducted-emissions testing of electrical meters that was performed by the FCC "does not replicate actual conditions...." By contrast, when Isotrope tested a meter in usage as intended, connected to a home wiring grid, "the conducted emissions from the meter at 915 MHz ISM frequencies in a residence was observed to be substantial,"

This confirms what we refer to as the antenna effect of smart meters, which results in emissions that far exceed those reported when meters are tested in a laboratory setting, disconnected from wiring. The Isotrope Report goes on to state that **"if the 915 MHz conducted energy were to be held to the same standard as 30 MHz, the level of the 915 MHz conducted energy from the AMR meter would fail."**

The Isotrope report thus substantiates that smart meters cause an extraordinary RF/MW antenna effect on electrical distribution systems when they are used as intended, rather than in the isolation of a testing laboratory.

See Isotrope Report:
Report on Examination of Selected Sources of Electromagnetic Fields at Selected Residences in Hastings on Hudson

2. The smart meter antenna effect results in injury to occupants of homes and business even where the meter is installed up to 150 feet away.

Many people are reporting becoming ill after smart meters, including AMR and ERT models, are installed on, in or near their homes and businesses. Reported symptoms include heart palpitations and other cardiac problems, ringing in the ears, sleep problems, anxiety, headaches, nausea, recurrence of cancer and more. These reports are too numerous and too consistent in nature to be dismissed as coincidental.

Where smart meters are installed up to 150 feet away from a home or business, the onset of these symptoms among occupants is attributable to the smart meter antenna effect.

SSMNY found evidence of the antenna effect when we visited the third floor apartment of a multi-family home in upstate New York where the residents, a mother and her daughter, have become very ill since their exposure to the RF/MW conducted then radiated emissions from a smart meter installed on the outside of the ground level of the building. On one occasion when we tested the RF/MW emissions at the meter itself, they were low. Nonetheless, our testing in a third floor bedroom confirmed the meter's antenna effect. In the bedrooms we measured levels of RF/MW emissions that exceeded the highest levels that our instruments would record, far beyond what is considered safe according to the findings in the 2012 BioInitiative Report. In the video, emissions measured zero at the meter, however, minutes later in the apartment the signal was again clearly heard and measured at high levels, disappearing when the circuit to the bedrooms was turned off. No other transmitters were plugged in on the circuit. The utility company has claimed that the meter is "non-transmitting" and no FCC identification number is visible. However, according to the meter's specifications "The kV2c meter family offers a large range of possible AMI communication technologies including RF Mesh, Cellular, Power Line Carrier, RS-232, RS-485, and Analog Phone Modem to support all of your Smart Grid applications."

The video record that we made of this testing and the smart meter antenna effect at this home can be seen here: Smart Meter Blamed For Destroying Family's Health

This video record demonstrates the importance of the conducted emissions documented in the Isotrope report and reveals how smart meters can cause illness for people sleeping in bedrooms distant from the meter. Final confirmation would require replacing the smart meter with an independently sourced analog meter and re-testing. Lacking that final proof, this video provides compelling evidence that conducted RW/MW emissions from smart meters can be extremely hazardous. A full investigation by the New York State Health Department and Centers for Disease Control is warranted.

*https://www.gedigitalenergy.com/SmartMetering/catalog/kv2c.htm

3. Smart meters have specific identifiable pulsed clicking signals.

The following video demonstrates the specific and distinct sound and RF/MW measurements of smart meters, using the identical measuring equipment that SSMNY used in the previous video. This corroborates that the signals that are audible in the prior video are attributable to the smart meter installed on the home that SSMNY visited.

The Sounds of Different RF radiation Sources with a RF Analyser

To compare:
See minute 1:38 in The Sounds of Different RF radiation Sources with a RF Analyser
See minute 3:57 in Smart Meter Blamed For Destroying Family's Health

4. Conclusion

The Isotrope report's findings concerning the antenna effect caused by smart meters, and SSMNY's observations of that effect and the injury it causes, debunk attempts by the industry to claim that these meters are safe. Those attempts depend on testing meters in the isolation of an FCC laboratory, without connecting them to wiring grids, using protocols which urgently need to be updated.

The utility industry and government regulators have presented no evidence that smart meters are safe. Moreover, the findings presented above confirm that these meters are unsafe despite the fact that they may appear to be operating within flawed FCC guidelines, in the isolation of the testing laboratory. They demonstrate that FCC testing needs to be updated from interference testing to health-based testing. In addition, the FCC should obtain assistance from the U.S. Environmental Protection Agency in establishing health-based standards and testing protocols.

The utility industry and government regulators made a dangerous mistake when they invested so heavily in smart meter technology before testing their impact on human health and safety. The industry should not be permitted to inflict the consequences of that mistake on us and our families by deploying this dangerous technology in our homes and businesses, against our will.

The FCC should acknowledge the inadequacy of its testing, remove these meters from the market and require utilities to replace non-analog meters with purely mechanical analog meters.

For additional information, please visit:

www.stopsmartmetersny.org

www.electricalpollution.com

Isotrope WIRELESS

Thinking outside the sphere

Report on Examination of Selected Sources of Electromagnetic Fields at Selected Residences in Hastings-on-Hudson

November 23, 2013

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Introduction

Isotrope, LLC was engaged by a group to evaluate the electromagnetic environment at several residences in Hasting-on-Hudson, New York. The clients expressed concern about human exposure to certain specific sources of electromagnetic fields. Of primary interest were the automatic meter reader (AMR) electric meters installed on local residences by Consolidated Edison. Also of interest were an electronic water meter equipped with a transmitter and cordless telephones operating with the DECT protocol. The general concerns expressed by the clients prior to the examination related to the various modes of propagation: radiated fields, conducted fields and re-radiated fields.

The clients sought an evaluation of the radiated and conducted emissions characteristics of these devices beyond merely comparing the emissions to applicable health and safety standards. The clients hypothesize that the emissions of some or all of the types of subject devices interact with human physiology in a manner that is not captured by conventional emissions safety guidelines. The clients' concerns relate primarily to the possible impact of these pulsed radio frequency emissions on humans in the residential environment. The examination was performed solely to characterize the nature and intensity of the emissions of concern. While the measured emissions are compared to the FCC exposure limitations, among other things, for reference, this report draws no conclusions about the risks of human exposure to these emissions.

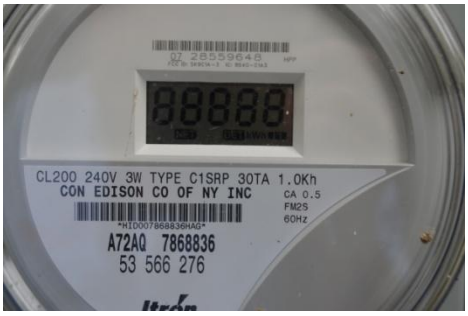
To evaluate the devices in situ, Isotrope made a field survey of the various emissions of concern, employing an array of electronic test equipment. Conclusions in this report include the observation that Part 15 radiated- and conducted-emissions testing of electrical meters does not replicate actual conditions because a power cord is attached to the meter socket in the test chamber rather than simulating the installation of the meter on a meter socket connected to both the power grid secondary and the residence distribution panel. Moreover, while the

conducted emissions from the meter at 915 MHz ISM frequencies in a residence was observed to be substantial, FCC Part 15 regulations limit conducted emissions testing to 30 MHz, ignoring the conducted emissions of the AMR radio signal.

Devices Under Test

Residential AMR Electric Meters

The AMR electric energy meters of interest are manufactured by iTron. As an intentional emitter of RF energy in the industrial, scientific and medical (ISM) band at 902-928 MHz, the model of meter has been factory tested to verify conformity with Part 15 regulations of the FCC (Title 47 of the US Code of Federal Regulations). Its test information is available from the FCC. Isotrope reviewed the test filings by referencing the FCC ID number posted on the meters.



The AMR meters were originally designed to transmit a 7 millisecond pulse of data about once every two seconds. (The meters we tested ran at about two pulses per minute.) A revision of the design is reported with a 45 ms pulse of data. The unit is designed to transmit one pulse on one radio channel and then change to another channel. This is called "frequency hopping." The hopping stays within the 915 MHz ISM radio band and is designed to minimize interference to other users of the band. The FCC reports say that radiated power levels are stated to conform to the FCC Section 15.247 interference limit for the band, which requires 1 watt or less power to the antenna.

Water Meter Transmitter

The water meter transmitter is manufactured by Neptune. Under its FCC ID number, the unit's certification filings describe a pulse is transmitted approximately once every 13 seconds. The device uses frequency hopping (see sidebar above). It is designed and tested under the same Part 15 interference regulations as the AMR meters.

DECT Phone

The cordless phone employs the DECT standard and operates in the unlicensed PCS band. DECT phones are required to comply with Part 15 interference regulations.

Test Methodology

Isotrope brought an array of equipment to the site in anticipation of a variety of possible measurement needs.

Equipment	Bandwidth	Antenna Pattern	Exposure Range
Anritsu MT8222A Spectrum Analyzer with ETS model 905 probe **("Anritsu")**	1 MHz to 1 GHz probe range	Dipole-like omnidirectional	Wide dynamic range, equivalent to a minimum of less than 1 picowatt per cm^2 depending on settings (<<-90 dB mW/cm^2)
Advantest Spectrum Analyzer **("Advantest")** used with Isotrope Line Impedance Stabilization Network **("LISN")**	LISN nominally 10 kHz to 30 MHz	Conducted measurement; Not Applicable	Not an exposure measuring setup
Tektronix Oscilloscope **("Oscilloscope")**	500 MHz	Conducted measurement; Not Applicable	Not an exposure measuring setup
Gigahertz Solutions HF35-C field intensity meter (provided by others) **("HF35-C")**	800 MHz to 2.5 GHz	Log Periodic directional	Wide dynamic range, equivalent to a minimum of 10 picowatts per square centimeter (-80 dB mW/cm^2)
NARDA 8718 Meter with 8722-D Conformal Probe **("NARDA")**	300 kHz-40 GHz	3D omnidirectional	2% to 1500% of the FCC limit for general population/uncontrolled areas; equivalent to a minimum of about 10 $\mu W/cm^2$ at 1 GHz (-20 dB mW/cm^2) [1]

[1] Although the emissions under observation are at levels that are lower than the FCC safety limits, the FCC is presently inquiring "whether there is a need for reassessment of the Commission radiofrequency (RF) exposure limits and policies." (FCC 13-39). Ultimately, all radiated power densities observed were substantially below the sensitivity of the Isotrope NARDA human exposure compliance meter.

To measure radiated emissions in relative proximity to the respective sources, including in the near field and at distances typically of no more than 40 feet radially from any particular source, Isotrope employed radio frequency spectrum analyzers and a reference electric field probe commonly used in close-in electromagnetic interference (EMI) testing. The relative insensitivity of the probe was not a constraint on the measurements due to the proximity of the probe to the sources of interest. The probe was also used in close proximity to power wiring and conductive surfaces to sense any localized fields.

To examine conducted energy on the power lines, Isotrope used a line impedance stabilization network (LISN). The LISN was used to feed a spectrum analyzer, and also to feed an oscilloscope.

Finally, the client provided a Gigahertz Solutions HF35-C field intensity meter. This device employs an attached log-periodic antenna to sample the electric field between 800 MHz and 2.5 GHz. This frequency span encompasses the most common wireless telephone bands (Cellular, SMR, PCS, AWS, BRS) as well as 915 MHz ISM and 2.4 GHz WiFi, among others. The HF35-C is a relatively sensitive instrument that has plenty of dynamic range to explore the residential wireless signal environment.

The Gigahertz Solutions HF35-C measures the electric field and converts to equivalent plane wave free space power density (reported in microwatts per square meter - $\mu W/m^2$). The unit is highly sensitive, capable of reading on the more sensitive scale to values as low as 0.1 $\mu W/m^2$ or -80 $dBmW/cm^2$. This is comparable to the received signal strength of an FM radio station broadcasting from about 10 miles away.

AMR Electric Meter

HF-35C Equivalent Power Density

At three residences AMR electric meters were observed. They consistently emitted short pulses once every thirty seconds. The HF35-C instrument was set to peak reading mode to capture as much of the pulse peak power as possible. With the HF35-C meter within about 1.5 to 2 feet of the AMR meters, the pulse would register on the high scale at levels typically between -43 and -37 $dBmW/cm^2$ (500 to 2000 $\mu W/m^{2)}$, depending on the orientation of the instrument's antenna.

Closer to the AMR meter, the HF35-C would regularly blank the display on receiving a pulse, indicating an over-range condition.[2]

Whether or not the pulse was over-range, the pulse energy would be retained by the instrument's averaging circuits and the subsequent readings would steadily decay back to the background level over the course of five seconds or so. It is important to note that only the first reading captures emitted RF energy. The subsequent readings as the meter reading decays to a baseline level are artifacts of the way the meter handles pulsed emissions and do not indicate emissions are present. The instrument manual explains this phenomenon as "charging and drooping", acknowledging that a peak reading may be "even up to a factor of ten too low." The graphic below illustrates how the instrument may capture some of the energy of the pulse and then show a decaying level after the pulse has ended.

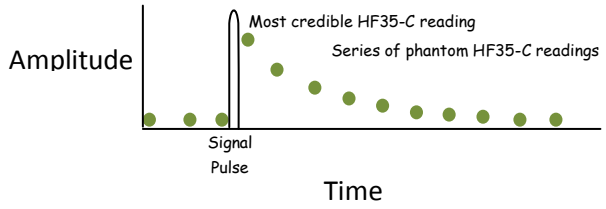


Figure 1 - Illustration of HF35-C Meter Readings over Time, in the Presence of a Single Signal Pulse

Spectrum Analysis

Using a spectrum analyzer, the AMR meter pulses were also captured in both the frequency domain and the time domain.

The pulse power levels obtained by the spectrum analyzer at the second residence were on the order of -20 dBm with the sensor approximately 6 inches from the meter's internal antenna. Recall that dBm are units of power measurement. To translate to human exposure terminology, the power received by the instrument through its antenna has to be translated to units of power per unit area, such as milliwatts per square centimeter (mW/cm^2). Based on the

[2] Note that the instantaneous power density (the pulse power density) is reported. FCC exposure specifications base public exposure on a 30 minute averaging time. In 30 minutes there would be about 60 pulses of about 50 ms duration. This totals to about 3 seconds of emissions to be averaged over 30 minutes. This way of calculating exposure reduces the FCC interpretation of exposure to 2 tenths of a percent of the measured peak.

instrumentation characteristics, this translates to an equivalent of -20 dBmW/cm^2 free space pulse power density at 6 inches from the meter.

The result on the spectrum analyzer is as much as 20 dB higher than on the HF35-C meter. This higher reading is due to two probable differences. First, the spectrum analyzer was substantially closer to the signal source than the HF35-C. Second, even if the instruments were at the same distance, it is expected that the HF35-C response to pulse inputs would artificially diminish its reading. Overall, there is enough consistency between the results of the two measurement methods to confirm the more precise measurements of the spectrum analyzer.

Away from the AMR Meter

Inside the residences, the received power levels from the AMR meters were consistent with the weakening of the signal that would be expected with increasing distance from the meter and signal absorption of residential construction. On the second floor at the opposite side of the house from the meter (in two residences tested) the AMR meter pulses were extremely diminished to the point of not being measurable on the HF35-C meter, and the pulse's clicking sound produced by the HF35-C AM detector would diminish and recede into the background noise. Similarly, attempts to capture occasional pulses on the spectrum analyzer in rooms distant from the AMR meter were often not fruitful. Measured pulse levels tended to range between -60 dBmW/cm^2 indoors nearest the meters to levels less than the sensitivity of the HF35-C instrument (< -80 dBmW/cm^2) in opposite ends of the residences. With a sensitivity of less than -90 dBmW/cm^2, the spectrum analyzer confirmed the unmeasurable levels of the AMR meter emissions were less than -90 dBmW/cm^2 in more distant parts of the houses tested.

In the basement of one residence, directly behind the cement block wall with the AMR meter on the outside, the combination of the meter's metal enclosure and the cement block construction reduced the AMR meter's signal level to -63 dBmW/cm^2 (5 µW/m^2). Outside, in front of the meter, the signal level was consistent with the power density observed near the other AMR meters (-20 to -40 dBmW/cm^2). The signal loss into the basement was about a 30 dB reduction over the free space loss that would occur outside the meter. In other words, the strength of the signal just behind the basement wall was about a thousand times weaker than the strength of the signal outside in front of the meter.

Conducted Emissions

Within the electric meter enclosure, the 915 MHz emission of the AMR meter is radiated within several inches of the power lines that pass through the meter enclosure on the way to the main service panel. Consequently, it is likely that the house electrical system conducts some of the

915 MHz signal into the residence. In the basement described above, the power cable penetrates the cement block wall, going from the meter outside to the main circuit panel mounted inside near the penetration. The nearest electrical outlet in the basement is on an interior wall approximately 12 feet away (perhaps 20 feet by wire).

A line impedance stabilization network was connected to the outlet, treating the meter/electrical panel as the device under test. A spectrum analyzer was connected and the spectrum was monitored. With the FCC regulated range below 30 MHz, the conducted emissions appeared to be compliant with the regulations. Above 30 MHz, there was a substantial conducted 915 MHz component on the power line.

The conducted 915 MHz signal level was approximately -55 dBm (about 52 dBµV RMS). The LISN is not calibrated for 915 MHz measurements; however it is reasonable to assume that if there is any error in reading a 915 MHz signal from the power line, the error is likely to cause the reading to be lower than the actual condition, due to impedance mismatch and UHF losses in the LISN. The 52 dBµV measurement is therefore conservative, erring on the side of understating the conducted 915 MHz energy.

If the 915 MHz conducted energy were held to the same standard as 30 MHz, the level of the 915 MHz conducted energy from the AMR meter would fail. FCC Part 15 conducted emissions regulations do not specify conducted emissions limits above 30 MHz. The 30 MHz limit for an appliance injecting noise into the power line is 50 dBµV at 10 ft (cable distance from the device under test).

Conducted-then-Radiated Emissions?

Emissions that are captured by house wiring and conducted around the house may ultimately be radiated from outlets and along the house wiring. When in close proximity to conductive objects (house wiring, outlets, metal lamp) the measured levels increased. This is consistent with the known behavior of objects that “re-radiate” RF energy. The apparent re-radiation of these objects created elevated fields close to them, while not materially affecting the generalized ambient field levels in the rooms tested.

The general ambient field levels in the houses followed the basic pattern of being weaker as the distance from the source (at the meter) increased. While showing elevated “hot spots” of energy near the conductive objects, these conductive objects did not appear to be major contributors to the overall ambient fields in each room.

For example, in one house, the ambient levels of the AMR signal (and a DECT phone signal emitted from the first floor) were observed to have a spatial peak value in proximity to house

wiring in the wall of a second floor bedroom by a bed as well as in proximity to a metal floor lamp in another bedroom, among other locations. The spatial peaks near the electrical wire and floor lamp were, on one hand, several orders of magnitude lower than the measured radiated signals found near the electric meters and the DECT phones, yet, on the other hand, these conducted/reradiated signals were still substantially greater than the ambient emissions found generally in the same rooms as the conductive objects.

The spatial peaks that occur near conductive objects connected to the house electrical wiring could be the result of two factors. First, there could be resonant re-radiation of the over-the-air signal and/or, second, radiation of emissions conducted from the source. Resonant re-radiation occurs when a conductor is of such electrical dimensions that it acts as a passive antenna, receiving a signal from the air, resonating and reradiating the signal. Such an object may or may not be connected to a wiring network like the house electrical system. Radiation of conducted emissions occurs when conducted energy (from the house wiring) reaches conditions that cause the conductive object to radiate like an antenna.

Water Meter

The water meter of interest is located in a public park containing a tennis court. The park is approximately the size of one house lot, and is surrounded by houses on approximately ¼ acre lots. The meter is mounted on an in-ground water pipe. The water pipe is exposed below grade and is marked by a wooden post. Mounted on the wooden post is a weather-tight electronics package with a label revealing information including an FCC ID number. One low-voltage cable connects the analog meter to the electronics. There is no power connection.

Researching the FCC ID number, the unit is a transmitter that operates in the 911-924 MHz band. Like the AMR electric meters, the water meter AMR transmitter on the post is designed to transmit a burst of data at regular intervals. Operation is designed to be compliant with the Part 15 emission limit (less than 1 watt).

The HF-35C instrument detected a pulse emitted every 13 seconds, which was most apparent as an

audible click on the audio detector. As is sometimes the case with direction-finding in the near field, the pulses were strongest within a 10 foot radius of the transmitter, but within that radius the signal level varied with position and sensor antenna orientation. The pulses registered on the most sensitive range of the HF-35C. It is not known what the pulse response of the instrument is, however the unit was kept on peak detection mode, which is intended to capture more realistic measurements of peaky signals. In close proximity to the water AMR transmitter power was similar to that of the electric AMR meters.

There was plenty of background noise near the water meter. Various kinds of cell site emissions appeared to be the dominant components, based on the detected audio provided by the HF35-C, in addition to the short bursts from the Neptune transmitter which were audible approximately every 13 seconds.

A scan of the radio spectrum with a spectrum analyzer resulted in an array of wireless signals and other similar signals at levels that would normally be expected in a residential area. Because the water meter transmitter frequency hops like the AMR electric meter transmitter does, its emissions were not captured on the spectrum analyzer during the short visit at the water meter. The radio frequency power of the water meter transmitter is comparable to that of the AMR meters, according to the FCC test data. The behavior of the unit observed in the park was consistent with this information.

DECT Telephone Set

Some of the residences included in the survey had cordless telephone base units and one or more cordless phones associated with them. Operating in the unlicensed PCS band at 1920-1930 MHz, these units are designed to share the spectrum with other DECT phone sets in the same neighborhood without mutually interfering and without intercepting the communications of the others. They operate by monitoring the band and selecting an available channel. Once on a channel, the base units send short bursts of data, enabling the handheld units to share the channel using time division duplexing. The base units were observed on the spectrum analyzer to be transmitting their signals at levels consistent with their unlicensed use, which are substantially below the applicable RF exposure limits.

Summary Conclusions

The following observations result from the survey.

- **Interference Compliant.** The radio transmitters of interest appeared to be functioning within the FCC radiated interference limits imposed in Part 15.
- **Interference Specifications are Not Exposure Specifications.** Part 15 exists to enable compatible use of the radio spectrum by myriad devices that use radio frequencies without requiring licensing of the use. It is not a safety specification.
- **Strongest Fields are Found Near the Sources.** The greatest potential whole body exposure to the AMR meter energy would occur near the meter and would be less than 1 mW/m^2 (-40 $dBmW/cm^2$).
- **Range of In-Home Exposure to EMR Meter Emissions:** Regardless of the previous conclusion, the emissions of the AMR meters are well above ambient RF levels and measured in occupied space from below -90 $dBmW/cm^2$ at more distant rooms to about -60 $dBmW/cm^2$ inside the exterior walls nearest the meters.
- **AMR Conducted Emissions Are Strong, but Not Regulated.** The conducted emissions of the AMR electric meters at the 915 MHz band are substantial, but are not regulated by Part 15 (which cuts off above 30 MHz). If the 30 MHz limit were applied to 915 MHz, it is probable that the meter would fail a lab test, subject to the following observation.
- **AMR Meter Lab Testing Fails to Simulate in Situ Wiring.** The lab testing of the AMR meters employed a simple power cord temporarily attached to the meter mounted in a panel. The meter does not normally employ a power cord. This approach does not simulate the manner in which the house wiring feeds through the electric meter. The meter has two power connections: one entering the meter typically from the top to deliver power to the meter and another exiting the bottom of rear of the meter panel to supply power to the main breaker panel. Using a power cord instead of setting up the power wiring the way the device is actually used may not reveal how the house circuit wiring through the meter may act. The actual in situ wiring may be more like an antenna that may pick up unwanted RF energy and noise within the meter and conduct it into the residence. See photo appended to this report.
- **Reradiation and Incidental Radiation Exists as Expected.** House wiring (and other metallic objects and cables) act as concentrators or reradiators of RF energy that produce spatial peaks of RF energy near the conductors. This is a well-known phenomenon (particularly at AM broadcast frequencies, where the effect near high power AM stations is substantial – the effect exists on all frequencies to some degree, depending on the frequency and radiated power level and dimensions of the

conductor); the appearance of conducted RF energy and localized RF fields around conducting objects at AMR and DECT frequencies is consistent with experience.

- **Reradiation and Incidental Radiation Appears Near Conductive Objects.** Reradiated energy from in-house conductors (such as electrical wiring) is lower than the emissions in the vicinity of the radiating antenna. The nature of passive reradiation is that the reradiating object or material cannot increase the power it receives. Therefore, the amount of energy emitted by the reradiator cannot be greater than that which is emitted by the source that excites the reradiator. Also, as the distance from the source to the reradiator increases, the field intercepted by the reradiator diminishes.
- **Table 1, below, Summarizes Ambient Levels of the AMR Meters Tested.**

Table 1 - Comparison of Exposure Levels from Emissions of the AMR Meter under Test

Location of Measurement	Equivalent Plan Wave Free Space Power Density†	Device
Approximately 6 inches away	-20 dBmW/cm^2 *	Spectrum Analyzer
1 – 2 feet away	-37 to -43	HF35-C ††
Inside occupied spaces	-60 to less than -90**	Spectrum Analyzer
Inside occupied spaces	-60 to less than -80**	HF35-C

†The general practice is to convert measured field (volts per meter) to power density assuming the measurement was of a signal radiating in free space. In proximity to objects or to the radiating element, this conversion may overstate the actual power density.

††Note that HF35-C readings may be artificially low due to meter design with respect to short pulses.

*The use of decibels makes it easier to present data over a wide numerical range. The more negative the number of dB, the weaker the signal.

-20 dBmW/cm^2 is one one-hundredth of a milliwatt per square centimeter (0.01).
-60 dBmW/cm^2 is one millionth of a milliwatt per square centimeter (0.000001).
-90 dBmW/cm^2 is one billionth of a milliwatt per square centimeter (0.000000001).

** The lower figures (-90 and -80) represent the approximate sensitivity of the instruments. When signals are not measured, it is because they are below the sensitivity of the instrument.

Remediation

Removal

If the AMR meter emissions at a particular residence are to be minimized, the most effective method is to remove the meter. Of course, this must be done in coordination with the electric power supplier.

Reduce Duty Cycle (to about once a month)

If the meter can be replaced with one that only responds when polled, then there would only be a brief emission during monthly meter readings when a meter reader passes the location of the meter with a radio that interrogates the meter and receives its reply. However, as AMR meters give way to so-called smart meters that communicate with devices in the house, the rate of transmissions will increase to provide data communication between the meter and smart appliances.

Retrofit with Protection

If neither of the above can be accomplished to eliminate or minimize the meter emissions, shielding the meter so that its emissions are diminished or are focused away from the residence could be considered. One vendor of a meter shield product made a demonstration that obtained what was apparently about 40 dB of attenuation of the meter's radiated emission (a reduction to one ten thousandth of the power density without the shield.)

Also, based on our conducted emission test, if shielding is employed, then it may be desirable to place filtration on the power lines entering/exiting the meter panel to reduce conducted emissions. A search for "power line EMI filter" will yield a variety of sources. A party experienced in EMI suppression should be involved in working with the electrician.

Conclusion

This report summarizes the results of a field survey of the ambient emissions of AMR meters at three residences in Hasting on Hudson, New York. Measurements were taken near the outdoor meters and within the residences to which they are attached, including radiated emissions testing in three homes and conducted emissions testing on the electrical wiring in one home. Radiated emissions measurements were compared between two primary measuring devices. Measurements were also compared to applicable interference and exposure standards for reference.

Appendix 1

Photograph of Test Configuration of AMR Meter,
with substitute power cord installed in lieu of typical house mains wiring configuration

Source:

FCC Part 15.247 Certification
Test Report

FCC ID: SK9C1A-3

FCC Rule Part: 15.247

ACS Report Number: 05-0122-15C

Manufacturer: Itron Electricity Metering, Inc.
Equipment Type: Electricity Meter With FHSS Transmitter
Trade Name: CENTRON ™ ICARe
Model: C1A-3

Test Setup Photographs

Isotrope Note:

Power cord installed for testing. Not consistent with field applications of device.

No House Mains wiring installed for simulation (on radiated and conducted emissions tests).

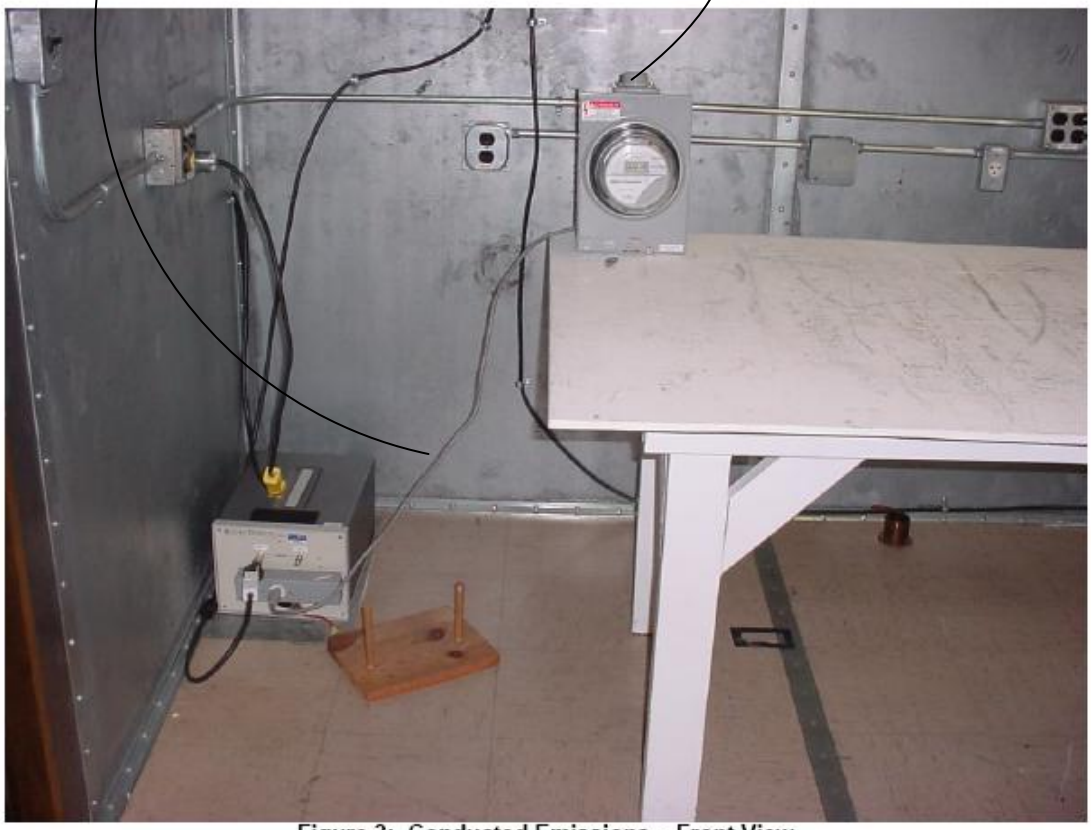


Figure 3: Conducted Emissions – Front View

Exhibit F

CONFIRMED:
The order of the Head State Sanitary Physician of the Republic of Kazakhstan
« _28 _» _ November 2003_г. № 69

Permissible levels
of high-frequency electromagnetic pollutions' voltage in a wires of industrial frequency alternating current

Sanitary-epidemiologic norms

1 General provisions

1. Sanitary-and-epidemiologic norms «Permissible levels of high-frequency electromagnetic pollutions' voltage in a wires of industrial frequency alternating current» (further - norms) define levels electromagnetic pollutions in electric wires of power supply of an industrial electric equipment, office techniques, electrical household appliances in a range 1 kiloHertz – 400 kiloHertz (further – kHz).

2. The present norms are directed on improvement and optimization of a sanitary-epidemiologic situation and prevention of environmental contamination by electromagnetic radiation, and also management of corresponding risk, in addition to existing norms.

3. Heads of the organizations and physical persons which activity is connected to operation of the industrial organizations using the equipment and devices, being sources of electromagnetic radiation, provide maintenance of requirements of the present norms.

4. In the present norms the following terms and definitions are used:

1) electromagnetic pollution – parasitic (casual) frequencies in a network of an alternating current of industrial frequency of 50 Hertz (further – Hz) which source is not determined;

2) electromagnetic pollutions – one of kinds of electromagnetic pollution in a range of frequencies 1 kHz – 400 kHz, arising in networks of an alternating current of industrial frequency.

2 Permissible level of electromagnetic pollutions' voltage

5. The permissible level of a high-frequency electromagnetic pollutions' voltage in a range of frequencies 1-400 kHz in a wires of an alternating current of industrial frequency of 50 Hz should not exceed 0,05 volts (further – V) 50 millivolts (further – mV).

3 Choice of points of the control

6. Control points get out in the socket of wires of an alternating current of industrial frequency (50 Hz), taking place near to a plug (socket) of a cable of the connected equipment. The number of control points depends on number of workplaces. In each control point one measurement is carried out.

4 Recommended devices for the control

7. For the control high-frequency electromagnetic pollutions in a range of frequencies (1-400) kHz in a wires of an alternating current of industrial frequency of 50 Hz are recommended to be used millivoltmeter, having corresponding characteristics and registered in the State Register of Republic of Kazakhstan.

5 Requirements to carrying out of measurement

8. The device is plugged into socket of an alternating current in a control point.

9. Tap switch of ranges necessary to put in position of 1-2 V.

10. If indications are not fixed or are small, tap switch put in position 100-999 mV or in position 1,1-99,9 mV, depending on a registered level of a voltage.

Results are registered and compared to the norms specified in item 5 of the present norms.

Exhibit F

Wireless Technology Violates Human Rights

How universal exposure to radiation from wireless devices complying with existing inadequate safety limits violates the Nuremberg Code of Ethics

Catherine Kleiber, www.electricalpollution.com

The report "Wi-Fi – A Thalidomide in the Making. Who Cares?" by Barrie Trower makes it clear that **exposure to radiation from wireless technology will cause DNA damage, including damage to the mitochondrial DNA that is irreparable and will transmit to all future progeny** of affected females. In a mouse study, "*RF Radiation–Induced Changes in the Prenatal Development of Mice*" (http://avaate.org/IMG/pdf/magras_mice_study.pdf), six months of real-life ambient exposure to a medley of radiation sources at levels well below those allowed by FCC RF limits resulted in total sterility, which did not reverse. It would be expected to take longer in humans, however this finding supports the urgency of the points Mr. Trower makes in his report which can be found at http://www.electricalpollution.com/documents/WiFiAThalidomideInTheMakingWhoCares.pdf.

Thus, there is NO possible way that the FCC can both promote wireless technology and protect the public health and safety, as directed by the House Committee on Commerce in H.R. Report No. 104-204, p. 94.

Obviously, Congress made clear with the stipulation that it was the FCC's responsibility to adopt uniform RF regulations "with adequate safeguards of the public health and safety" (H.R. Report No. 104-204, p. 94) that they were not interested in promoting wireless technology at the expense of the public health and safety.

The **FCC is obligated by the directive in H.R. Report No. 104-204, p. 94 to inform Congress it is impossible to both promote wireless and protect the public health and safety** since it is now clear that wireless technology has the potential to compromise the genetic integrity of individuals for all future generations. Continued promotion of wireless technology in spite of that and the following evidence:

- Report of Partial Findings from the National Toxicology Program Carcinogenesis Studies of Cell Phone Radiofrequency Radiation in Hsd: Sprague Dawley® SD rats (Whole Body Exposures) bioRxiv preprint first posted online May. 26, 2016 (http://dx.doi.org/10.1101/055699)
- *Tumor Promotion by Exposure to Radiofrequency Electromagnetic Fields Below Exposure Limits for Humans* (http://www.ncbi.nlm.nih.gov/pubmed/25749340)
- The BioInitiative Reports (www.bioinitiative.org)
- Biological Effects from RF Radiation at Low-Intensity Exposure, based on the BioInitiative 2012 Report, and the Implications for Smart Meters and Smart Appliances (http://emfsafetynetwork.org/wp-content/uploads/2013/08/Biological-Effects-From-RF-Radiation-and-Implications-for-Smart-Meters-June-5-2013-2.pdf)
- "*Provocation study using heart rate variability shows microwave radiation from 2.4 GHz cordless phone affects autonomic nervous system*" (http://www.magdahavas.com/wordpress/wp-content/uploads/2010/10/Havas-HRV-Ramazzini1.pdf) and replicated (http:// www.ncbi.nlm.nih.gov/pubmed/23675629#)
- "*Oxidative mechanisms of biological activity of low-intensity radiofrequency radiation*" (http://www.ncbi.nlm.nih.gov/pubmed/26151230)

- "*Impacts of radio-frequency electromagnetic field (RF-EMF) from cell phone towers and wireless devices on biosystem and ecosystem – a review*" (http://www.biolmedonline.com/Articles/Vol4_4_2012/Vol4_4_202-216_BM-8.pdf)
- "*Report on Possible Impacts of Communication Towers on Wildlife Including Birds and Bees*" (http://www.moef.nic.in/downloads/public-information/final_mobile_towers_report.pdf)
- "CRITICISM OF THE HEALTH ASSESSMENT IN THE ICNIRP GUIDELINES FOR RADIOFREQUENCY AND MICROWAVE RADIATION (100 kHz - 300 GHz)" (www.electricalpollution.com/documents/Cherry2000EMR_ICNIRP_critique_09-02.pdf)
- "*Swedish review strengthens grounds for concluding that radiation from cellular and cordless phones is a probable human carcinogen*" (http://www.ncbi.nlm.nih.gov/pubmed/23664410)

would not only violate the directive in H.R. Report No. 104-204, p. 94 which said it was the Commission's responsibility to adopt uniform RF regulations "with adequate safeguards of the public health and safety" and the principles of public health protection, but also be in direct violation of the entire Nuremberg Code of Ethics (http://www.hhs.gov/ohrp/archive/nurcode.html).

Prior to approval of wireless technology for civilian use, it is clear from "Wi-Fi – A Thalidomide in the Making. Who Cares?" that it was already known that there were bio-effects from exposure to pulsed microwave radiation that were separate from tissue heating and it is clear from Cellular Telephone Russian Roulette: A Historical and Scientific Perspective (http://microondes.files.wordpress.com/2010/03/robert_c_kane_cellular_telephone_russian_roulette.pdf) that extensive scientific literature existed showing that harmful tissue heating could occur extremely quickly and locally at levels well below those allowed by the ICNIRP and IEEE limits and also that ample evidence existed of disabling effects on organisms when chronically exposed to RF radiation.

Reasonable people with full access to the data could and did think a dangerous situation was being created by 1984, see "Biological Effects of Radiofrequency Radiation" (EPA 600/8-83-026F, 1984) (http://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=300065H1.txt) and then again prior to the passage of the 1996 Telecommunications Act (http://www.emrpolicy.org/litigation/case_law/docs/epa_to_fcc_3nov_93.pdf). In spite of this, no biologically protective safety limits were implemented to protect citizens during daily life.

It violates the Nuremberg Code of Ethics to experiment on non-consenting people who cannot stop the experiment, especially when harm can reasonably be expected to result. That is exactly what has happened and is happening. The fact that those reasonable expectations have been fulfilled can be seen in The BioInitiative Reports and in many of the documents submitted for consideration within these FCC dockets (ET Docket No. 13-84, and ET Docket No. 03-137).

Industry continues to generate uncertainty, in spite of the numerous well-designed studies showing harm, and continues to call for additional studies instead of action. Results of the society-wide human experiment continue to roll in which demonstrate the harmfulness of the technology. A small sample of these studies are below:

- "*Prenatal and Postnatal Exposure to Cell Phone Use and Behavioral Problems in Children*" (http://www.ncbi.nlm.nih.gov/pubmed/18467962)
- "*Apparent decreases in Swedish public health indicators after 1997—Are they due to improved diagnostics or to environmental factors?*," Hallberg and Johansson (http://www.pathophysiologyjournal.com/article/S0928-4680(09)00002-9/abstract)

- "*The Influence of Being Physically Near to a Cell Phone Transmission Mast on the Incidence of Cancer*" (http://emrstop.org/index.php?option=com_docman&task=doc_details&gid=4&Itemid=18)
- "*Changes of Clinically Important Neurotransmitters under the Influence of Modulated RF Fields- A Long-term Study under Real-life Conditions*" (http://www.radiationresearch.org/images/RRT_articles/Buchner%20Eger%20Rimbach%20Study%202011%20ENG%20FINAL%20Revised%2029%20July%202011.pdf)
- "*How does long term exposure to base stations and mobile phones affect human hormone profiles?*," Eskander et al. (http://www.sciencedirect.com/science/article/pii/S0009912011027330)
- "*Microwave frequency electromagnetic fields (EMFs) produce widespread neuropsychiatric effects including depression.*" (http://dx.doi.org/10.1016/j.jchemneu.2015.08.001)

Indeed, in light of evidence that harm could be expected from its use and exposure is involuntary in many cases, there has been a violation of the entire Nuremberg Code of Ethics since RF technology was approved for civilian use without biologically-meaningful RF safety limits in place, specifically "1. The voluntary consent of the human subject is absolutely essential ..." and "9. During the course of the experiment, the human subject should be at liberty to bring the experiment to an end...". Millions of people are being exposed to a dangerous toxin in an open-ended non-consenting experiment which they cannot bring to an end and over which they have no control.

Performing additional studies without immediate action to put protective safety limits in place based on the array of existing studies showing harm, only continues the massive violation of human rights.

The fact that any new microwave-based technology **might** be safer is no excuse to contend that this open-ended non-consenting experiment should continue. Any new **possibly** safer technology should be studied in double-blind placebo controlled medical-style laboratory safety studies using approved protocols carefully designed to detect health effects before being allowed to undergo **controlled consenting** medical-style human studies. The track record of previous microwave-based (wireless) technology and the Nuremberg Code of Ethics demands it!

Therefore, the **FCC is obligated** by H.R. Report No. 104-204, p. 94, by the principles of public health protection, and by the Nuremberg Code of Ethics **to immediately place a moratorium on additional spectrum sales, antenna installations, transmitting utility meter installations, new wireless technologies, and sales of wireless devices,** while notifying Congress, The Environmental Protection Agency, The Center for Disease Control, The National Institute of Health, and The U.S. Department of Health and Human Services of the **serious health hazard posed by wireless technology and seeking their professional support in developing RF safety limits that truly protect the public health from biological harm.** *If further experiments are needed, they should be done immediately using approved medical-style protocols, not using the entire population in an inescapable uncontrolled study done without consent.*

If the FCC would like to argue that this is not an experiment because data collection is not consistent enough and negative outcomes were expected or known, then population-wide exposure to this toxin is still either "inhuman treatment" or "torture," both of which are human rights violations. **Money is not a justifiable reason to expose an entire population to a potentially lethal agent that can be reasonably expected to isolate and disable many, impairing their ability to reach their full potential and live their life fully and freely.**

Exhibit F

Before the Federal Communications Commission
Washington, D.C. 20554

In the Matters of:		
Use of Spectrum Bands Above 24 GHz For Mobile Radio Services	)	GN Docket No. 14-177
Establishing a More Flexible Framework to Facilitate Satellite Operations in the 27.5-28.35 GHz and 37.5-40 GHz Bands	)	IB Docket No. 15-256
Petition for Rulemaking of the Fixed Wireless Communications Coalition to Create Service Rules for the 42-43.5 GHz Band	)	RM Docket No. 11664
Amendment of Parts 1, 22, 24, 27, 74, 80, 90, 95, and 101 To Establish Uniform License Renewal, Discontinuance of Operation, and Geographic Partitioning and Spectrum Disaggregation Rules and Policies for Certain Wireless Radio Services	)	WT Docket No. 10-112
Allocation and Designation of Spectrum for Fixed-Satellite Services in the 37.5-38.5 GHz, 40.5-41.5 GHz and 48.2-50.2 GHz Frequency Bands; Allocation of Spectrum to Upgrade Fixed and Mobile Allocations in the 40.5-42.5 GHz Frequency Band; Allocation of Spectrum in the 46.9-47.0 GHz Frequency Band for Wireless Services; and Allocation of Spectrum in the 37.0- 38.0 GHz and 40.0-40.5 GHz for Government Operations	)	IB Docket No. 97-95

To: Office of the Secretary
Federal Communications Commission
Washington, DC 20554

Comment Filed by: Catherine Kleiber
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September 30, 2016

Dear FCC Commissioners,

Spectrum Frontiers Proceeding is being represented as an unqualified good, but it is not. It will do great harm to human health and the environment.

Please halt implementation of Spectrum Frontiers. There has been no NEPA review of the environmental and human health impacts of moving forward with 5G. The FCC has put the cart before the horse in promulgating rules for 5G without first studying the safety of 5G for humans and the environment. There is consensus within the scientific community that the existing FCC limits for wireless radiation do not protect the population from biological effects (www.EMFscientist.org)

The National Toxicology Program recently release results showing that radiofrequency radiation (RFR) can indeed both break DNA and cause cancer. A replicated European study has found that RFR is also a cancer promoter (http://ehtrust.org/science/facts-national-toxicology-program-cellphone-rat-cancer-study/). Furthermore, the literature on RFR in the very high frequency bands required for 5G document DNA breakages, serious cellular resonance effects, and other detrimental metabolic effects (http://www.bioinitiative.org/report/wp-content/uploads/pdfs/sec15_2012_Evidence_Disruption_Modulation.pdf and http://www.stopglobalwifi/documents/2001_kositsky_et_al._-_ussr_review.pdf).

Non-industry funded studies have consistently found links between RFR and various negative biological effects (www.bioinitiative.org). They include serious neurological, cardiac, and metabolic effects, as well as DNA breakage which can lead to cancer and genetic defects (http://www.mainecoalitiontostopsmartmeters.org/?p=1469).

Studies, including the National Toxicology Program studies, have shown wireless to be a dangerous technology and 5G, according to Chairman Wheeler's own comments, is an infrastructure intensive technology. So, invest in safe, wired infrastructure instead of spending a lot of money to saturate entire communities with hazardous radiation. The "cool" factor is not worth the peril.

It is time for the FCC to act in a precautionary way and stop promoting wireless, especially especially Spectrum Frontiers and WiFi. WiFi is already causing radiofrequency sickness in children and adults. The data suggests 5G is likely to be even more dangerous. No one should be forced to be exposed to a carcinogen when connectivity can be achieved in safer ways. You should be completing the process of establishing meaningful biologically-based population protective RF safety limits instead of forcing people to be exposed to more RF radiation.

There are effects far beyond cancer. My family has had the misfortune to experience them firsthand. It has been a nightmare. Not only is the FCC abdicating its responsibilities by not establishing meaningful biologically protective RF safety limits before promoting further RF exposures, it is violating human rights. Please read "Wireless Technology Violates Human Rights," attached and at http://www.electricalpollution.com/documents/WirelessViolatesHumanRights2016.pdf. If you continue to implement Spectrum Frontiers, which will increase exposure to a carcinogen and pollutant with potent harmful biological activity, you will also be violating human rights and the Nuremberg Code of Ethics.

Recent scientific publications look specifically at causality, such as M.L. Pall in "*Microwave Frequency Electromagnetic Fields (EMFs) Produce Widespread Neuropsychiatric Effects Including Depression*" (J Chem Neuroanat. 2015 Aug 20; http://www.sciencedirect.com/science/article/pii/S0891061815000599). It discusses the causal relationship between exposure to radiation from wireless technology and neuropsychiatric effects. Mechanisms of action are also discussed. It is likely the rampant proliferation of wireless radiation (to which 5G would add greatly) is an important factor behind the marked increase in mass killings due to the detrimental psychiatric effects it can have. Many of the perpetrators were technology addicts and thus highly exposed to RF radiation. Prudence and caution would dictate a halt to the proliferation of wireless technology.

A recent study by Yakymenko, et al., 2015, *Oxidative Mechanisms of Biological Activity of Low-intensity Radiofrequency Radiation* finds in 93 of 100 reviewed studies a wide pathogenic potential of the induced Reactive Oxygen Species (ROS) and their involvement in cell signaling pathways explains a range of biological/health effects of low intensity RF radiation, which include both cancer and non-cancer pathologies. Their concluding analysis demonstrates low-intensity RF radiation is an impressive oxidative agent for living cells with a high pathogenic potential and that the oxidative stress induced by RF radiation exposure should be recognized as one of the primary mechanisms of the biological activity of this kind of radiation (http://www.mainecoalitiontostopsmartmeters.org/wp-content/uploads/2015/07/Yakymenko-et-al-2015.pdf).

Not only is the radiation utilized by wireless technology dangerous to people, it is dangerous to the environment. Therefore, the need for a NEPA review is triggered.

FCC must complete a NEPA review and EIS prior to implementing 5G

The potential environmental and human health hazards from 5G necessitates a comprehensive NEPA review [*Envtl. Def. Fund v. Tenn. Valley Auth.*, 468 F.2d 1164, 1174 (6th Cir. 1972)] and, specifically, a formal Environmental Impact Statement (EIS). The EIS should include a full review of environmental effects, as well as human health and safety. The FCC has an obligation to evaluate whether "*services or capabilities are essential to public health, safety, or in the public interest*" (H.R. Report No. 104-204, p. 94) and so must protect the public from possible harm caused by radiofrequency radiation.

The FCC is not entitled to essentially disregard comments that do not provide global cost-benefit analysis (*Scenic Hudson v. Federal Power Commission)*. The Commission has an affirmative duty to inquire into and consider all relevant facts. The FCC must use government resources to perform the relevant analysis. The FCC should request the EPA use its National Risk Management Research Laboratory resources and experts to conduct all cost analyses necessary.

This proposal also triggers the need for a Memoranda of Understanding (MOU) with U.S. Fish and Wildlife Service under Executive Order 13186 concerning effects on migratory birds.

U.S. Department of Interior States: Current Radiation Standards Inapplicable

On February 7, 2014, the U.S. Department of Interior (DOI) stated, "*the electromagnetic radiation standards used by the Federal Communications Commission (FCC) continue to be based on thermal heating, a criterion now nearly 30 years out of date and inapplicable today,*" in reference to the current limits governing radiation utilized by WiFi. The DOI letter discusses a number of studies in which birds appear harmed by low-level RF radiation associated with cell towers and other wireless technologies (http://www.ntia.doc.gov/files/ntia/us_doi_comments.pdf). **Furthermore, DOI required FirstNet to undergo a comprehensive NEPA review and planning program. Implementation of 5G, which will**

have similar widespread impacts, requires a NEPA review as well.

RF radiation kills and damages trees

Trees are being killed and damaged across the U.S. and world-wide even without full-scale implementation of 5G. RF radiation is being implicated as the cause. Several studies show the very serious effects that RF radiation has on the health of trees. Trees are essential to the welfare of the global environment and the continuation of the human race. Decimation of the Amazon rainforest by direct human actions has been oft-cited as endangering the global environment, the FCC should not be moving forward with implementing a technology, 5G wireless technology, that will hasten the RF caused death of our urban and rural forests. Please read the following papers to see the toll RF is already taking on trees. We cannot afford additional forest die-off. Large mature trees are being seriously damaged and killed, this damage will take 50 years or more to repair.

- Radiofrequency radiation injures trees around mobile phone base stations https://www.researchgate.net/publication/306435017_Radiofrequency_radiation_injures_trees_around_mobile_phone_base_stations
- Adverse Influence of Radio Frequency Background on Trembling Aspen Seedlings: Preliminary Observations https://www.hindawi.com/journals/ijfr/2010/836278/
- Tree damage in the vicinity of mobile phone base stations http://kompetenzinitiative.net/KIT/wp-content/uploads/2016/06/Tree-damages-in-the-vicinity-of-mobile-phone-base-stations.pdf
- The trees make it easy to recognize the effects of RF-EMF. Examples of tree damage: http://kompetenzinitiative.net/KIT/wp-content/uploads/2016/09/Trees-in-Bamberg-and-Hallstadt-Documentation-2006-2016.pdf

The damage to trees is not theoretical. We are seeing it on our farm now. We have seen it in the city for years, but now we are seeing it in the country as well, on a widespread basis.

July 24, 2016
Note thinness in tree on right and bare spot developing between trees (both cottonwoods)

August 9, 2016
Damage progressing quickly

September 12, 2016
More leaves lost. No sign of healthy fall leaf color so fall is not the cause.

July 24, 2016
These cottonwoods trees began exhibiting damage similar to the trees above in 2015. Most of them greened up this spring, then had the leaves die and drop. Two still retain leaves low down. Others are completely dead.

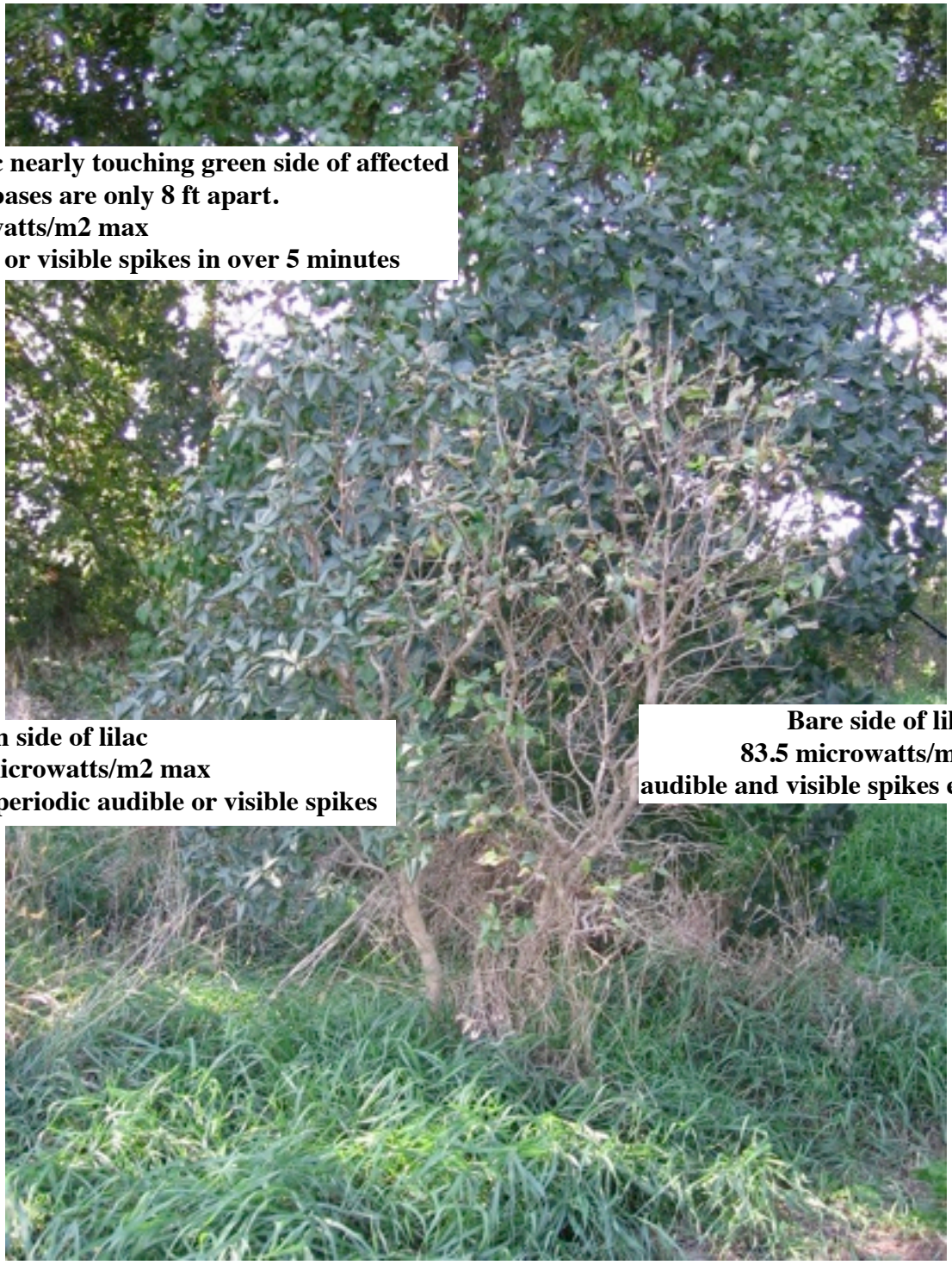
As you can see the damage to trees is progressing quickly to death. Balimori discusses the fact that "*White and black poplars (Populus sp.) and willows (Salix sp.) are more sensitive. There may be a special sensitivity of this family exists or it could be due to their ecological characteristics forcing them to live near water, and thus electric conductivity.*" Certainly the trees that are worst off in our area are willows and cottonwoods and they are growing in areas that are wet, but I have seen trees of all types exhibiting damage. Please think of the future. We cannot live without a healthy tree population. We rely on them for the very oxygen we breathe. **No technology is worth endangering something as essential as our source of oxygen.**

September 18, 2016
Notice uneven leaf drop, unhealthy green, and absence of fall color. Characteristic of RF damage

Notice necrotic lesions and off color characteristic of RF leave damage. No normal fall color present, despite on-going leaf drop.

Note the small damaged leaves across the top of the tree. Trees of all different species around our yard are demonstrating this damage. Also mentioned in the aforementioned papers. We have no transmitters so all RF from outside sources.

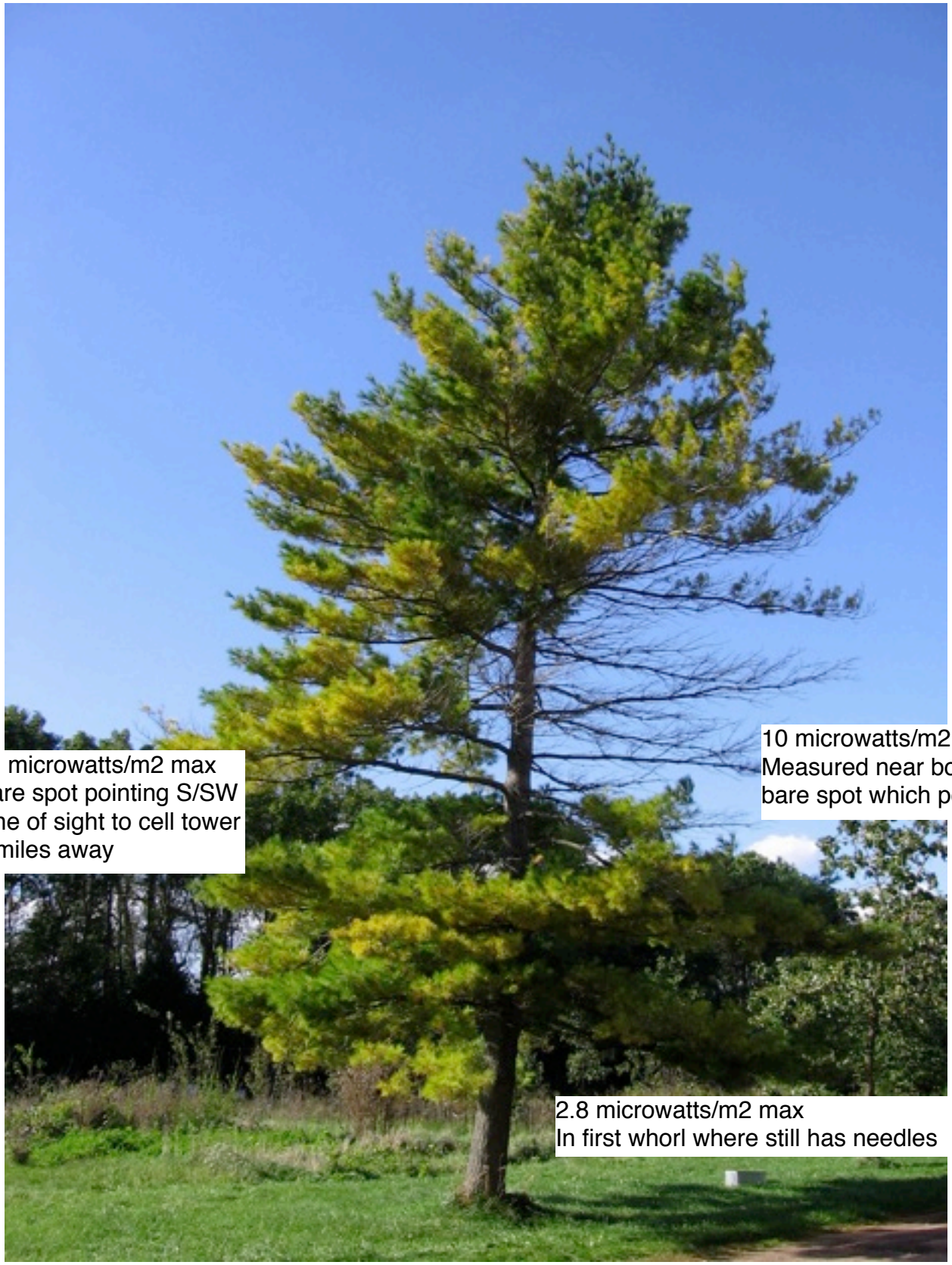
Lilac showing marked one sided damage. Signal appears to be coming from a WiFi tower on a hill about a mile away.



Green lilac nearly touching green side of affected lilac. The bases are only 8 ft apart.
0.6 microwatts/m2 max
no audible or visible spikes in over 5 minutes

Green side of lilac
2.8 microwatts/m2 max
only periodic audible or visible spikes

Bare side of lilac
83.5 microwatts/m2 max
audible and visible spikes every 9 seconds


39 microwatts/m2 max
Bare spot pointing S/SW
Line of sight to cell tower
6 miles away
10 microwatts/m2 max
Measured near bottom of
bare spot which points N
2.8 microwatts/m2 max
In first whorl where still has needles

Please read the following reports which demonstrate that wireless technology is causing serious harm to wildlife:

- "The Report on Possible Impacts of Communication Towers on Wildlife Including Birds and Bees" commissioned on 30th August 2010 by the Ministry of Environment and Forest, Government of India http://www.moef.nic.in/downloads/public-information/final_mobile_towers_report.pdf

- "Impacts of radio-frequency electromagnetic field (RF-EMF) from cell phone towers and wireless devices on biosystem and ecosystem – a review" http://www.biolmedonline.com/Articles/Vol4_4_2012/Vol4_4_202-216_BM-8.pdf

- Balmori, A. "Electromagnetic pollution from phone masts. Effects on wildlife," Pathophysiology (2009), doi:10.1016/j.pathophys.2009.01.007 http://www.ncbi.nlm.nih.gov/pubmed/19264463

The Supreme Court of India ordered cell towers removed from schools, colleges, hospitals and playgrounds in Rajasthan because of radiation being "hazardous to life." The court's amazing 200+ page decision thoroughly reviews the worldwide evidence that cell towers are harming human beings and wildlife (http://timesofindia.indiatimes.com/city/jaipur/No-mobile-towers-near-schools-hospitals-directs-Rajasthan-HC/articleshow/17399705.cms).

On July 5, 2013 the Supreme Court of India upheld this decision.

Steps for minimizing exposure to RF can be found at www.electricalpollution.com on the Solutions page. They could be used to make the United Stated on of the healthiest nations on the planet.

Don't unleash a dangerous environmental pollutant on your friends, family, and, indeed, the whole country. Protect your family, friends, and the country - halt implementation of Spectrum Frontiers. Help bring wired broadband to everyone by placing a tariff on the use of wireless and use the proceeds to fund dedicated wired broadband internet. Be on the right side of history.

Sincerely,

Catherine Kleiber

Exhibit F

Before the Federal Communications Commission
Washington, D.C. 20554

In the Matters of:		
Use of Spectrum Bands Above 24 GHz For Mobile Radio Services	)	GN Docket No. 14-177
Establishing a More Flexible Framework to Facilitate Satellite Operations in the 27.5-28.35 GHz and 37.5-40 GHz Bands	)	IB Docket No. 15-256
Petition for Rulemaking of the Fixed Wireless Communications Coalition to Create Service Rules for the 42-43.5 GHz Band	)	RM Docket No. 11664
Amendment of Parts 1, 22, 24, 27, 74, 80, 90, 95, and 101 To Establish Uniform License Renewal, Discontinuance of Operation, and Geographic Partitioning and Spectrum Disaggregation Rules and Policies for Certain Wireless Radio Services	)	WT Docket No. 10-112
Allocation and Designation of Spectrum for Fixed-Satellite Services in the 37.5-38.5 GHz, 40.5-41.5 GHz and 48.2-50.2 GHz Frequency Bands; Allocation of Spectrum to Upgrade Fixed and Mobile Allocations in the 40.5-42.5 GHz Frequency Band; Allocation of Spectrum in the 46.9-47.0 GHz Frequency Band for Wireless Services; and Allocation of Spectrum in the 37.0- 38.0 GHz and 40.0-40.5 GHz for Government Operations	)	IB Docket No. 97-95

To: Office of the Secretary
Federal Communications Commission
Washington, DC 20554

Comment Filed by: Dan Kleiber
N9387 Riverview Dr.
Waterloo, WI 53594
(920) 478-9696

September 30, 2016

Dear Sir or Madam,

The FCC must halt implementation of 5G wireless while a NEPA review of the environmental and human health impacts and an EIS are completed. The FCC has put the cart before the horse in promulgating rules for 5G without first studying the safety of 5G for humans and the environment. There is consensus within the scientific community that the existing FCC limits for wireless radiation do not protect the population from biological effects (www.EMFscientist.org).

FCC must complete a NEPA review and EIS prior to implementing 5G
The potential environmental and human health hazards from 5G necessitates a comprehensive NEPA review [*Envtl. Def. Fund v. Tenn. Valley Auth.*, 468 F.2d 1164, 1174 (6th Cir. 1972)] and, specifically, a formal Environmental Impact Statement (EIS). The EIS should include a full review of environmental effects, as well as human health and safety. The FCC has an obligation to evaluate whether "*services or capabilities are essential to public health, safety, or in the public interest*" (H.R. Report No. 104-204, p. 94) and so must protect the public from possible harm caused by radiofrequency radiation.

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The National Toxicology Program recently released results showing that radiofrequency radiation (RFR) can indeed both break DNA and cause cancer. A replicated European study has found that RFR is also a cancer promoter (http://ehtrust.org/science/facts-national-toxicology-program-cellphone-rat-cancer-study/). Furthermore, the literature on RFR in the very high frequency bands required for 5G document DNA breakages, serious cellular resonance effects, and other detrimental metabolic effects (http://www.bioinitiative.org/report/wp-content/uploads/pdfs/sec15_2012_Evidence_Disruption_Modulation.pdf and http://www.stopglobalwifi/documents/2001_kositsky_et_al._-_ussr_review.pdf).

Non-industry funded studies have consistently found links between RFR and various negative biological effects (www.bioinitiative.org). They include serious neurological, cardiac, and metabolic effects, as well as DNA breakage which can lead to cancer and genetic defects (http://www.mainecoalitiontostopsmartmeters.org/?p=1469).

My family has already experienced harm from the rapidly rising ambient levels of RFR. The rising ambient RFR levels, due to the recent wireless insanity, are already causing my family to experience symptoms of Radiofrequency Sickness. My sons get cardiac arrhythmias. My wife is functionally impaired by RFR in multiple ways. I experience high blood sugar and increased insulin resistance when I am exposed to RFR, in addition to other symptoms.

The rapidly increasing RFR levels is impacting our ability to earn a living. I used to vend at farmers markets in Madison, Wisconsin and I am no longer able to do so due to the rising ambient RFR levels causing serious neurological symptoms suggestive of incipient ALS. The symptoms disappeared at the end of market season when I was able to spend time at my shielded home in much lower ambient RFR levels. (The levels outside our home are hundreds to thousands of times lower than ambient Madison levels. Even so, I can tell the improvement in my health when I am inside my shielded home where the levels are a third to a tenth the ambient outside levels and peaks are reduced by over half.) ALS is a progressive fatal neurological disorder whose incidence is increasing (https://wwwn.cdc.gov/als/Download/Neurol%20Clin_ALS_Risk_Factors_2015.pdf). ALS is being linked to factors including oxidative damage (positively linked to smoking which causes oxidative damage), EMF exposure, and military service which would entail high levels of RFR exposure. RFR has been shown to cause oxidative damage (http://www.ncbi.nlm.nih.gov/pubmed/26151230). If my experience is any indicator, the FCC is directly responsible for those deaths by promoting a dangerous technology in complete disregard of the science and the scientists who are calling for biologically-based population-protective RFR safety limits. This willful disregard of the consequences is a violation of our human rights and the Nuremberg Code of Ethics, please read "Wireless Technology Violates Human Rights," attached and at http://www.electricalpollution.com/documents/WirelessViolatesHumanRights2016.pdf.

Studies, including the National Toxicology Program studies, have shown wireless to be a dangerous technology and 5G, according to Chairman Wheeler's own comments, is an infrastructure intensive technology. So, invest in safe, wired infrastructure instead of spending a lot of money to saturate entire communities with hazardous radiation. The "cool" factor is not worth the peril.

Take the time to do due diligence and protect all our safety by conducting a comprehensive NEPA review and EIS. Protect your family, friends, and the country - implement a wired broadband internet program instead. Be on the right side of history.

Sincerely,

Dan Kleiber

Exhibit G

Wireless Technology Violates Human Rights

How universal exposure to radiation from wireless devices complying with existing inadequate safety limits violates the Nuremberg Code of Ethics

Catherine Kleiber, www.electricalpollution.com

The report "Wi-Fi – A Thalidomide in the Making. Who Cares?" by Barrie Trower makes it clear that **exposure to radiation from wireless technology will cause DNA damage, including damage to the mitochondrial DNA that is irreparable and will transmit to all future progeny** of affected females. In a mouse study, "*RF Radiation–Induced Changes in the Prenatal Development of Mice*" (http://avaate.org/IMG/pdf/magras_mice_study.pdf), six months of real-life ambient exposure to a medley of radiation sources at levels well below those allowed by FCC RF limits resulted in total sterility, which did not reverse. It would be expected to take longer in humans, however this finding supports the urgency of the points Mr. Trower makes in his report which can be found at http://www.electricalpollution.com/documents/WiFiAThalidomideInTheMakingWhoCares.pdf.

Thus, there is NO possible way that the FCC can both promote wireless technology and protect the public health and safety, as directed by the House Committee on Commerce in H.R. Report No. 104-204, p. 94.

Obviously, Congress made clear with the stipulation that it was the FCC's responsibility to adopt uniform RF regulations "with adequate safeguards of the public health and safety" (H.R. Report No. 104-204, p. 94) that they were not interested in promoting wireless technology at the expense of the public health and safety.

The **FCC is obligated by the directive in H.R. Report No. 104-204, p. 94 to inform Congress it is impossible to both promote wireless and protect the public health and safety** since it is now clear that wireless technology has the potential to compromise the genetic integrity of individuals for all future generations. Continued promotion of wireless technology in spite of that and the following evidence:

- Report of Partial Findings from the National Toxicology Program Carcinogenesis Studies of Cell Phone Radiofrequency Radiation in Hsd: Sprague Dawley® SD rats (Whole Body Exposures) bioRxiv preprint first posted online May. 26, 2016 (http://dx.doi.org/10.1101/055699)
- *Tumor Promotion by Exposure to Radiofrequency Electromagnetic Fields Below Exposure Limits for Humans* (http://www.ncbi.nlm.nih.gov/pubmed/25749340)
- The BioInitiative Reports (www.bioinitiative.org)
- Biological Effects from RF Radiation at Low-Intensity Exposure, based on the BioInitiative 2012 Report, and the Implications for Smart Meters and Smart Appliances (http://emfsafetynetwork.org/wp-content/uploads/2013/08/Biological-Effects-From-RF-Radiation-and-Implications-for-Smart-Meters-June-5-2013-2.pdf)
- "*Provocation study using heart rate variability shows microwave radiation from 2.4 GHz cordless phone affects autonomic nervous system*" (http://www.magdahavas.com/wordpress/wp-content/uploads/2010/10/Havas-HRV-Ramazzini1.pdf) and replicated (http:// www.ncbi.nlm.nih.gov/pubmed/23675629#)
- "*Oxidative mechanisms of biological activity of low-intensity radiofrequency radiation*" (http://www.ncbi.nlm.nih.gov/pubmed/26151230)

- "*Impacts of radio-frequency electromagnetic field (RF-EMF) from cell phone towers and wireless devices on biosystem and ecosystem – a review*" (http://www.biolmedonline.com/Articles/Vol4_4_2012/Vol4_4_202-216_BM-8.pdf)
- "*Report on Possible Impacts of Communication Towers on Wildlife Including Birds and Bees*" (http://www.moef.nic.in/downloads/public-information/final_mobile_towers_report.pdf)
- "CRITICISM OF THE HEALTH ASSESSMENT IN THE ICNIRP GUIDELINES FOR RADIOFREQUENCY AND MICROWAVE RADIATION (100 kHz - 300 GHz)" (www.electricalpollution.com/documents/Cherry2000EMR_ICNIRP_critique_09-02.pdf)
- "*Swedish review strengthens grounds for concluding that radiation from cellular and cordless phones is a probable human carcinogen*" (http://www.ncbi.nlm.nih.gov/pubmed/23664410)

would not only violate the directive in H.R. Report No. 104-204, p. 94 which said it was the Commission's responsibility to adopt uniform RF regulations "with adequate safeguards of the public health and safety" and the principles of public health protection, but also be in direct violation of the entire Nuremberg Code of Ethics (http://www.hhs.gov/ohrp/archive/nurcode.html).

Prior to approval of wireless technology for civilian use, it is clear from "Wi-Fi – A Thalidomide in the Making. Who Cares?" that it was already known that there were bio-effects from exposure to pulsed microwave radiation that were separate from tissue heating and it is clear from Cellular Telephone Russian Roulette: A Historical and Scientific Perspective (http://microondes.files.wordpress.com/2010/03/robert_c_kane_cellular_telephone_russian_roulette.pdf) that extensive scientific literature existed showing that harmful tissue heating could occur extremely quickly and locally at levels well below those allowed by the ICNIRP and IEEE limits and also that ample evidence existed of disabling effects on organisms when chronically exposed to RF radiation.

Reasonable people with full access to the data could and did think a dangerous situation was being created by 1984, see "Biological Effects of Radiofrequency Radiation" (EPA 600/8-83-026F, 1984) (http://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=300065H1.txt) and then again prior to the passage of the 1996 Telecommunications Act (http://www.emrpolicy.org/litigation/case_law/docs/epa_to_fcc_3nov_93.pdf). In spite of this, no biologically protective safety limits were implemented to protect citizens during daily life.

It violates the Nuremberg Code of Ethics to experiment on non-consenting people who cannot stop the experiment, especially when harm can reasonably be expected to result. That is exactly what has happened and is happening. The fact that those reasonable expectations have been fulfilled can be seen in The BioInitiative Reports and in many of the documents submitted for consideration within these FCC dockets (ET Docket No. 13-84, and ET Docket No. 03-137).

Industry continues to generate uncertainty, in spite of the numerous well-designed studies showing harm, and continues to call for additional studies instead of action. Results of the society-wide human experiment continue to roll in which demonstrate the harmfulness of the technology. A small sample of these studies are below:

- "*Prenatal and Postnatal Exposure to Cell Phone Use and Behavioral Problems in Children*" (http://www.ncbi.nlm.nih.gov/pubmed/18467962)
- "*Apparent decreases in Swedish public health indicators after 1997—Are they due to improved diagnostics or to environmental factors?*," Hallberg and Johansson (http://www.pathophysiologyjournal.com/article/S0928-4680(09)00002-9/abstract)

- "*The Influence of Being Physically Near to a Cell Phone Transmission Mast on the Incidence of Cancer*" (http://emrstop.org/index.php?option=com_docman&task=doc_details&gid=4&Itemid=18)
- "*Changes of Clinically Important Neurotransmitters under the Influence of Modulated RF Fields- A Long-term Study under Real-life Conditions*" (http://www.radiationresearch.org/images/RRT_articles/Buchner%20Eger%20Rimbach%20Study%202011%20ENG%20FINAL%20Revised%2029%20July%202011.pdf)
- "*How does long term exposure to base stations and mobile phones affect human hormone profiles?*," Eskander et al. (http://www.sciencedirect.com/science/article/pii/S0009912011027330)
- "*Microwave frequency electromagnetic fields (EMFs) produce widespread neuropsychiatric effects including depression.*" (http://dx.doi.org/10.1016/j.jchemneu.2015.08.001)

Indeed, in light of evidence that harm could be expected from its use and exposure is involuntary in many cases, there has been a violation of the entire Nuremberg Code of Ethics since RF technology was approved for civilian use without biologically-meaningful RF safety limits in place, specifically "1. The voluntary consent of the human subject is absolutely essential ..." and "9. During the course of the experiment, the human subject should be at liberty to bring the experiment to an end...". Millions of people are being exposed to a dangerous toxin in an open-ended non-consenting experiment which they cannot bring to an end and over which they have no control.

Performing additional studies without immediate action to put protective safety limits in place based on the array of existing studies showing harm, only continues the massive violation of human rights.

The fact that any new microwave-based technology **might** be safer is no excuse to contend that this open-ended non-consenting experiment should continue. Any new **possibly** safer technology should be studied in double-blind placebo controlled medical-style laboratory safety studies using approved protocols carefully designed to detect health effects before being allowed to undergo **controlled consenting** medical-style human studies. The track record of previous microwave-based (wireless) technology and the Nuremberg Code of Ethics demands it!

Therefore, the **FCC is obligated** by H.R. Report No. 104-204, p. 94, by the principles of public health protection, and by the Nuremberg Code of Ethics **to immediately place a moratorium on additional spectrum sales, antenna installations, transmitting utility meter installations, new wireless technologies, and sales of wireless devices,** while notifying Congress, The Environmental Protection Agency, The Center for Disease Control, The National Institute of Health, and The U.S. Department of Health and Human Services of the **serious health hazard posed by wireless technology and seeking their professional support in developing RF safety limits that truly protect the public health from biological harm.** *If further experiments are needed, they should be done immediately using approved medical-style protocols, not using the entire population in an inescapable uncontrolled study done without consent.*

If the FCC would like to argue that this is not an experiment because data collection is not consistent enough and negative outcomes were expected or known, then population-wide exposure to this toxin is still either "inhuman treatment" or "torture," both of which are human rights violations. **Money is not a justifiable reason to expose an entire population to a potentially lethal agent that can be reasonably expected to isolate and disable many, impairing their ability to reach their full potential and live their life fully and freely.**